Data for Paper

Published July 7, 1938

Carnegie Instn. Wash. Pub 487

pp 217-240

See also

San José de Comondú, Mexico

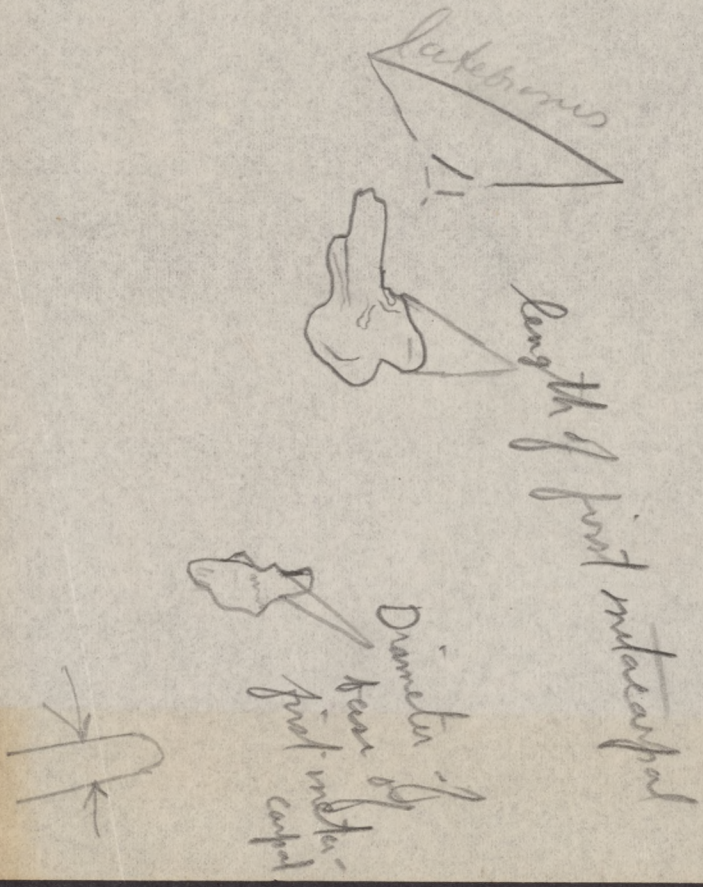
Caracara

SMITHSONIAN INSTITUTION

UNITED STATES NATIONAL MUSEUM

WASHINGTON, D. C.

_____, 193



Inclosure

SMITHSONIAN INSTITUTION

UNITED STATES NATIONAL MUSEUM

WASHINGTON, D. C.

September 4, 1936.

Dr. Hildegarde Howard,
C/o The Los Angeles Museum,
Exposition Park,
Los Angeles, California.

Dear Dr. Howard:

In reply to your letter of August 28, I am pleased to give you the following measurements of our specimen of the skeleton of Polyborus lutosus. These have been made in accordance with the indications in your letter:

90.3 - 92.7 San Diego specimens

tarsus	92.4
tibia	109.7
femur	68.0
carpus	62.3
ulna	112.9
humerus	108.5

I note that these all fall within the limits of variation found in your fossil bird. Should it be imperative that you examine the modern skeleton I am prepared to loan it to you with the understanding that it will be handled with the care due such a rare specimen.

With regard to latebrosus, the accompanying sketch will indicate the method of making the measurements that I gave in the original description. The type of this bird is in the American Museum of Natural History. I rather doubt that a plaster cast of it would be of much service to you.

Sincerely yours,

A. Wetmore

Assistant Secretary.

ebw

Taurus

2632 92.7 ap.? – 6.5'

2633 90.3 6.6

2634 91.5 5.9 (some scales 96)

88.8

95.0

344.0

358.0

184.0

1344.3

92.3

16) 1446.5 (90.4

144

65

64

(John Ridgway?
taurus 88.8 – 91.0 mm.)

Calif. Acad. Publ. W.E Bryant p. 283
Vol. 2, 1887)

all ♂'s			
	84	89	92
	84	89	92
	88	90	
	88	90	
	344	358	184

	Skull	Jaw	Sternum	Pelvis	Coracoid	Scapula	Humerus	Ulna	Radius	Carpus	Femur	Tibia	Tarsus
18456	✓	✓	✓	✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓ O	✓✓
18478	✓	✓	✓	✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
736	✓	✓	✓	✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
739	✓	✓	✓	✓	✓✓	✓ O	✓ ✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
236	✓	✓	✓	✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓ O	✓ O
206	✓	✓	✓	✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
19670	✓	✓	✓	✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
19671	✓	✓	✓	✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
322338	✓	✓	✓	✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
321805	✓	✓	✓	✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
Intorus	✓	✓	✓	✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓

February 26, (937)

Comparative Cervical material available

Type of Polybrous latebrosus external view. Natural Size. Shows particularly the posterior position of the notch of M I

Return to
Hildegarde Howard

max & min of large series

wing	tail	bill	tarsus	mid. toe	
16.40	11.65	1.35	95.0 mm. 3.75	2.10	lutosus max
15.00	10.50	1.25	88.2 mm 3.50	1.80	" min
16.50	10.00	1.48	95.0 3.75	2.10	chemaymax
14.60	9.0	1.20	81.7 mm 3.20	1.90	" min

~~Chars. of P. brodkorbi in general~~

1 Increase in size of bill & feet

2 shorter wing & tail

3 darker color

Size & proportion depts. not so variable in P. lutosus, however. Dif. larger in color

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Review of Thayer & Bangs on Birds of Guadeloupe Island
Auk 09, pp 319-320
In 1906 P. lutosus extinct

P. lutosus from Porto Rico
Carn Pub. Biol. Sc. Wash. 33
pp 77-82 (rep. 77), 1920

Polyborus Audubonii = P. lutosus

Lucas, F.A. Auk 1891 vol. 8, p. 219.

Skel. dif. extremely slight (proportion of limbs = sherwini?) judged by them alone. Thus are no grounds for considering the 2 birds as belonging to 2 species.

Ridgway, R. Auk 1887 pp 58-

Guadalupe Id. is off coast of Lower Calif. bet. lat. 28° 45' and 29° 10' N and about 220 miles SW from San Diego

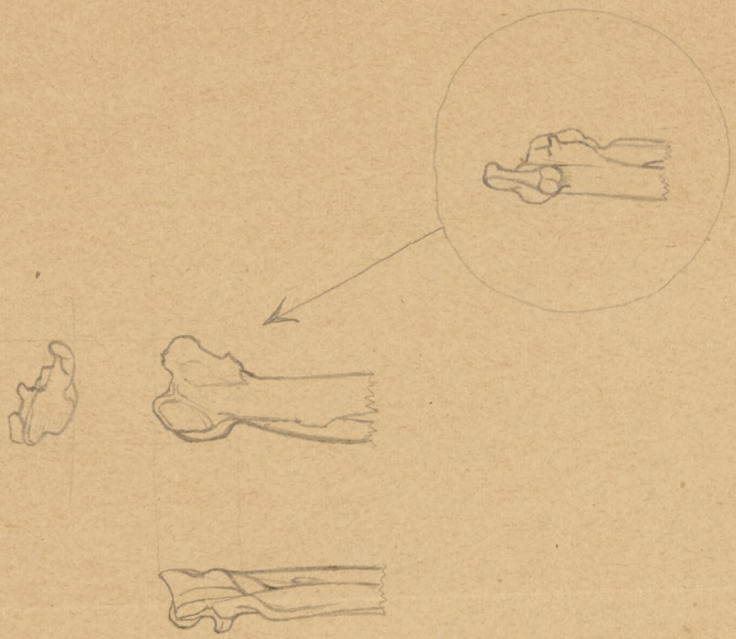
1875 coll. of birds from there by Dr. Edw. Palmer

8 spps. 72 specimens of land birds

Affinities of birds of this Island with those of Western No. Amer.

Each sp. has a closely related representative on the continent,

P. lutosus Audubon. Singularly enough, the Polyborus from Guadalupe resembles much more closely the So. Amer. species than that from Mexico (P. cheriway) The Id. is very distinct from either."



Polyborus Lutosus etc Comparison of sizes of various elements

Tarsus - fossil 81.9-94.1 - overlaps all others at some point but does not attain maximum of either Thamus or cheriway. Agrees with 4 avail. meas. of lutosus.

Tibia - fossil 100.5-112.3 - overlaps all others but does not attain max. of either Thamus or cheriway. Agrees with one avail. meas. of lutosus.

Femur - fossil - 63.1-73.0 - Overlaps all but does not attain maximum of either cheriway or Thamus Agrees with one available lutosus.

Carpus - 59.1-66.6 - Overlaps all but does not attain max. of Thamus. Cheriway & lutosus OK.

Ulna - 112.0-122.3 - Overlaps all, but does not attain max. of either cheriway or Thamus lutosus OK.

Humerus - 100.3-115.3 - just barely overlaps thamus min. (with fossil max.) cheriway & lutosus OK.

Ratio carpus & tarsus wing - 90.5-92% - Similar to Thamus but not cheriway or lutosus

Ratio tarsus & femur - 81.5-81.9 Unlike all - Thamus with tarsus rel. smaller & cheriway & lutosus relatively longer

Ratio humerus & tibia - like lutosus

Ratio carpus to ulna — " " " & overlaps cheriway

Ratio " " femur — unlike all rel. longer carpus smaller humerus.

lutosus alone.

Thamus	cheriway	lutosus	fossil
Long wing (307) 88.5-90.0% short legs (276)	shorter wing (291) 95.5-96.6% longer legs (281)	short wing (282) 95.0% rel long legs (268) this shorter than cheriway	rel long wing (288) 82.9-90.5% short legs (261)
Tibia smaller than humerus 95% (averages)	Tibia longer than hum. 103% (averages)	tibia & humerus about same 100.1%	Tibia smaller than humerus 97%
Carpus rel. small	carp. rel. smaller	carpus (like Thamus)	carpus rel. large
body size as (shown by coracoid) large	body size large	body size small	body slightly small (very overlap of Thamus & cheriway
taking 289 as average wing length of 262 " " leg " of all caracaras wing of Thamus long (301 min.) leg of " long (264 min.)	→	→	→ wing aver. (median = 289.?) leg a tip short
	wing long (62⅓% are longer than 289) leg " (60 (out of 77) are above 262)	wing a tip short? (282.?) leg a " long? (268.7)	
taking 297 as average wing length of 276 " " leg " of recent caracaras (exclusive of fossil) wing: all longer leg: 75% are shorter	wing: 50% longer, 50% shorter leg: 71% are longer	wing: short (7 mm.) leg: short (8 mm.)	rel. longer wings than 289, however wing short (88% are shorter) leg " (99% " ")
taking as aver. carpus			

Comparisons including lutosus contd
Caprus

① Extension (laterally) of trochlear surface to form crest
Markedly present in fossil latebrosus,
Less marked but evident in Brea (some) & lutosus
The barest suggestion in Thanus,
Absent in cherinay

② Area between pisiform & trochlea
Well excavated in fossil latebrosus
Rounded ridge running up from pisiform in cherinay with no indentation
" " " " in Thanus but stops just short of trochlea.
lutosus with ridge even less developed
Brea varies from Thanus to nearly approaching latebrosus

③ Area from pisiform to junction of MII & MIII
Brea with no marked excavation immediately below pisiform or well marked line continuing up from M3
Fossil latebrosus same No with no less depression below pisiform
? lutosus between fossil & latebrosus,
Thanus approximates latebrosus,
Cherinay - depression least marked & continuing of M3 less developed.

④ Contours of posterior external part of trochlea
Curve most prominent at mid-point
lutosus similar
Cherinay lower part of curve most prominent No points more nearly equal in dev. Thanus
Fossil Brea varying around an equal development
some being slightly toward cherinay, others toward Thanus, but keeping a middle course.

Beak

lutosus vs. Thamus & cheriway & fossil

(1) roughened area at cere between nares

well posterior in lutosus, back of edge where septum takes off

more anterior in Thamus - on level with, or very slightly in front of edge of septum

well anterior in cheriway - anterior to edge of septum

between lutosus & Thamus in position in fossil - even with, or very slightly behind edge of septum

(2) roughened area - line from lower border of nares to edge of ramus

from lower posterior edge of nares slanting backward & downward to ramus in lutosus

from lower posterior edge nares, but anterior to edge of septum, down & back to ramus in Thamus

from lower anterior edge of nares, downward & (almost straight down very slightly) backward to ramus in cheriway

?, very close to lutosus, Tho seems a bit anterior to septum in fossil

(3) distance from lower edge of nares to edge of ramus

9.3 in lutosus (to 10.1 ?)

10.2 - 10.5 in Thamus

10.6 - 11.1 in cheriway

7.6 - 8.8 in fossil

(4) Breadth of beak at roughened line on ramal edge

(14.3?) 15.0 - in lutosus

13.7 - 14.8, in Thamus

12.3 - 13.5, in cheriway

13.0 - 14.8, in fossil

(5) Height of beak ant. to roughened area of cere bet. nares

14.5 in lutosus

14.0 - 16.0 in Thamus

14.6 - 15.9 in cheriway

12.8 - 13.6 in fossil

Comparisons of Intarsus

Coracoid - smaller than either Tharus or cheriway
within range of fossil

Humerus - within range of cheriway + fossil
smaller than Tharus.

Ulna - same as humerus

Carpus — same " "

Femur — within range of Tharus + fossil
smaller than cheriway

Tibia - same as femur

☆ Tarsus — within range of all though smaller than all but one of cheriway;

Ratio of leg to wing — leg relatively longer than Tharus or fossil
— almost equalling ratio in cheriway

☆ Tarsus on basis of 6 specimens 88.8 - 95.0 mm. aver. 91.7
min. falls below cheriway, slightly above Tharus, well above fossil
max. equals mean of cheriway, above mean Tharus, 0.2 mm above max. of fossil

lutosus comparisons cont'd

Tibia

Relative breadth & length

Cherinway long, slender bone

Thanus rel shorter & stouter

lutosus agrees with Thanus in rel breadths of ends, but is intermed. in breadth of shaft (agrees with fossil here)

fossil is intermed. bet. cherinway & Thanus in rel. breadth & length — one slightly more slender (cherinway) but not equally min. of most slender (cherinway) or max. of broadest (Thanus) except in ratio of breadth of shaft ~~to breadth of end~~ (when compared to distal end) it surpasses max. of the latter, & does not overlap cherinway.

one fossil specimen in latter.

	average fossil	median fossil	Lutonus	fossil vs Lutonus no. above	%	no. below	%	Tharus aver. with 18478	Tharus aver. without 18478	fossil no. above (max.)	no. total	Tharus no. below 18478 min.	Cheriway aver.	Cheriway median	fossil vs Cheriway no. above max	total	no. below min.	compared to mean: Tharus above	Tharus below	%	Cheriway above	Cheriway below	%
Coacord	47.1	47.3	46.9	38	50%	38	50%	51.3	50.1	0	80	78	49.7	49.3	0	80	68	0	80	100%	1	78	98.7%
Amycus (68)	109.3	109.7	108.4	45	66.3%	23	33.7%	118.6	115.5	0	61	59	111.3	111.7	2	61	17	0	61	100%	18	50	73.6%
Ulua (50)	116.2	116.45	113.3	41	82%	9	18%	124.3	121.5	0	50	48	117.9	120.3	0	50	7	0	50	100%	12	37	74.5%
Carpus 148	63.2	63.2	61.0	130	87.9	15	10.1%	64.97	63.4	59 (with 148)	70		61.1	61.3	66	148	10	32	114	78.4%	129	18	12.2%
Tenuis (50)	65.9	65.7	67.9	7	14%	40	80%	71.5	68.8	0 (with 148)	50	37	69.8	69.9	0	50	43	1	50	94%	2	48	96%
Tibia (38)	106.2	106.3	108.6	6	15.7%	32	84.3%	112.6		1 (with 148)	38	29	114.5	114.9	0	38	37	0	38	100%	0	38	100%
Tarsus	88.8	89.2	92.2	23	9.4	237	88.7%	92.35	87.2	89 (with 148)	267	109	94.3	95.6	0	267	185	22	267	90.7%	3	264	99%

underlined columns
checked OK April 8, 1937
TTC

Pelvis Polygons

	a greatest length of vert. part	b br. at tips ant.	c length of blumbar vert.	d ant. breadth	e gr. br. across sacral cavities	ba	ca	da	ea	f br. across sacral auric.	g breadth below auric.	ga	
	× length inside												
Cheiway													
355	56.7	53.7	39.1	72.7	25.1	21.2	26.6	69.0	43.3	84.6	46.9	30.0	88.7	83.7	32.1	56.6	97
736	60.5	59.2	39.4	66.6	28.5	22.2	36.0	65.2	47.2	78.0	43.0	33.4	77.8	85.4	32.6	54.0	95.2
738	57.9	53.6	39.0	72.9	24.5	21.1	27.4	67.4	42.3	86.3	47.3	30.8	89.0	79.5	32.5	56.1	100.7
739	61.0	58.1	40.3	69.3	27.6	20.6	28.6	66.2	45.3	74.6	46.8	33.2	86.3	83.3	33.0	53.2	96.8
				4)276.5 (69.1			4)193.1 (48.3									4)233.4	
Thamo																	
18456	59.3	55.0	43.3	78.7	25.8	22.2	29.7	73.4	43.6	86.1	50.2	31.7	93.7	81.4	36.1	59.3	65.6
236	63.0	56.2	45.7	81.5	26.6	22.2	31.7	72.4	42.3	83.5	50.3	32.1	98.8	82.9	38.8	61.6	68.2
18478	65.2	62.8	46.0	73.3	29.1	23.2	32.8	70.6	44.7	79.8	50.4	36.8	89.3	79.3	38.5	59.2	64.3
206	61.3	55.1	40.9	74.3	27.3	20.1	28.4	66.9	44.6	73.7	46.4	30.2	94.3	90.5	33.2	53.3	60.4
			4)307.8 (76.9			4)214.4										4)225.5	
						53.6										64.1	
Brea fossil																	
E4678	56.3	52.0	43.2	83.0	24.6	23.0	—	76.8	43.7	93.5	×	×	×	×	36.2	64.4	69.7
D925	61.2	56.5	43.9+	78.8	26.8	22.6	32.4	72.0	43.8	84.4	53.0	33.1 / 32.6	95.0 / 99.4	82.3	39.1	64.0	68.3
E9619	59.1	52.7	41.9	79.6	25.7	22.3	30.7	71.0	43.5	86.8	50.3	29.3	104.8	81.7	37.0	62.6	70.2
E9618	58.5	52.9	42.9	81.2	24.4	23.4	30.6	73.4	42.7	95.8	52.3	30.9	99.1	79.1	36.8	63.0	69.5
J9522	56.7	51.7	43.2	83.3	24.8	22.4	29.7	76.5	43.9	90.4	52.7	29.1	102.0	85.3	36.6	64.5	70.7
D9083	58.6	53.0	44.0	83.1	25.6	24.3	29.7	75.0				30.2	98.7		36.6	62.5	69.1
E9618	58.6	—	42.8		24.6	23.4	30.3					32.9	98.3		36.9	62.0	—
E9617	58.8	53.5	42.7	79.8	26.0	23.7		72.4				29.6	—		32.2	63.3	69.6
			7)568 (81.2			5)284.9 (57.4										7)481	
																69.7	
Sutters						26.9											

31.0 87.8

× length taken inside

	90 bicingal cavity	av	90 br. ant.-troch.	av	90 br. below ant.-troch. →	av
Cheiway	43.0 – ~~49.5~~ 51.3	48.3	61.3 – 72.9	69.1	55.2 – 60.7	58.1
Thamo	51.6 – 56.5	53.6	73.3 – 81.5	76.9	60.4 – 69.2	64.1
Brea Sutters	56.0 – 58.3	57.4	78.8 – 83.3	81.2	69.1 – 70.7	69.7
	1		2		3	

Brea averages broader than ♂ the cheiway or Thamo tho overlapping Thamo ♀ more in dia. in meas. ① ② ③ in three indus. in meas. ② (The Brea is just one Thamo which is the "overlapper" each time.

Pelvis

Lutrons ♂ Mers

Thum
Dysplastic ♂ pelvis

	a gr. depth	b length Verts	c gr. br. across backs	d br. above auric. proc.	e renal length to verts	f renal cavity length	g gr. br. cav.	h least br. cav.	gf	hf	cb	db	gb	fb
206	77.2	61.3	40.4	37.9	32.4	28.2	28.4	17.7	100.8	62.8	68.2	61.9	46.4	71.6 92.8 46.1
18456	80.0	59.3	42.1	40.4	34.7	31.7	29.7	21.6	93.3	68.2	71.1	68.3	50.2	56.7 94.6 53.5
18478	88.0	65.2 ✓	51.7	43.8	36.7	36.8	32.8	23.0	89.1	62.5	79.5	67.5	50.8	56.6 92.7 56.5
236	77.1	58.5 ✓	42.8	41.7	33.2	32.0	31.7	24.3	98.1	76.5	73.4	71.4	53.3	65 89.4 55.3

Lutrons
199.6 79.4 57.8? 40.6 38.3 32.7 31.1 27.0 20.3 89.6 65.4 70.2 66.3 46.6 71.0 89.7

Cheirus
12220 72.2 55.5 ✓ 39.0 37.0 31.5' 28.8 27.5' 20.3 95.5' 74.1 70.3 66.7 49.5' 65 90.7 54.9
736 78.7 60.5' 39.0 35.9 29.4 30.0 26.0 19.0 86.7 63.4 64.5' 59.4 43.0 70.2 89.1 49.6
739 80.2 60.8 ✓ 40.7 37.8 34.0 33.3 28.7 19.5' 83.2 58.4 67.0 61.2 47.2 73.0 91.1 54.7
19671 80.1 57.5?, 40.1 37.9 33.0 30.9 28.0 20.7 90.6 67.1 69.7 66.0 48.7 70.6 88.3 53.7
322336 80.2 —
19670 78.8 ~~57.6~~ 57.1
35'5'
738 56.6
53.6

F2559 69.1 51.0
67.3 49.4

E9617	—	✓58.3	—	39.1	34.3	29.8		22.3	—	74.9	—	66.8	
9619	—	✓59.1	—	39.3	34.0	29.3	30.7	21.2	104.8	72.4	—	67.5' 52.0	
D9083	—	✓58.5	—	40.5'	34.2	30.3	29.7	22.0	98.1	72.6	—	69.3 50.7	
J9522	—	✓56.6	41.7	40.3	32.7	29.1	29.7	21.9	102.1	75.4	73.7	71.2 52.8	
F1795'	—	✓53.8 ✓	—	40.4	31.4	30.1	—	23.6	—	78.4	—	75.0	
E9618		✓58.4	—	40.0	35.2	30.9	30.4	22.3	98.4	72.3	—	67.5 52.2	
D9617	—	✓54.5		37.4	31.9	28.4	—	21.7	—	76.4	—	68.7	
E4678	—	✓56.3	43.0	40.0	32.9	29.3	—	21.2	—	72.4	76.0	71.2	
B9780	—	✓55.5	—	37.7	32.1	30.0	—	20.5'	—	69.1	—	68.0	
E9372	—	✓58.4	—	—	34.3	32.1	—	—	—	—	—	—	
D9254	—	✓61.1 ✓	—	41.0	35.5'	33.2	32.3	23.2	97.4	69.8	—	67.1 52.8	
E1329	—	✓56.7	—	—	32.8	28.1	—	—	—	—	—	—	
J9523	—	✓57.7	—	—	33.3	30.8	—	22.4	—	70.5	—	—	
E6005	—	✓57.2	~~57.3~~	—	33.2	—	—	—	—	—	—	—	
E9671	[illegible]	~~58.2~~ 57.0	43	—	32.1	31.5'	28.6	21.0	90.8	66.7	—	—	

Stevens affinities not sufficiently apparent

br. renal cav. ♂ length cav.
cheirus 83.2 – 95.5
Thums 89.1 – 100.2
mers 90.8 – 104.8
lutrons 86.8

br. ♂ length pelvis
Thums 62 – 71.6
Cheir. 59.1 – 67
mers 67. – 75
lut. 66.3

br. renal ♂ length
cheir. 43 – 49.5 pl
Thums 46.4 – 53.3
lutrons 46.6
mers 50.7 – 52.8

Proportions of fossil
Compared with means of these species

Leg – length shorter than all – nearest lutosus
Tarsus – shorter " " " "
Tibia – " " " " "
Femur – " " " " "
Wing – length between lutosus & cheriway – nearest cheriway
Carpus – longer than " " " , shorter than tharus
Ulna – " between " " " " " "
Humerus – " " " " " " "
Coracoid – shorter than tharus and cheriway about equal lutosus
? Sternum – " " " " lutosus " " cheriway
Pelvis – " " " about equal lutosus " "
Beak –
Breadth equals tharus exceeds cheriway, under lutosus
Height less than all

A To tharus – ① with exception of carpus mean of each limb element falls below min. for tharus.
② legs are more nearly like those of tharus in length than any
③ Body (cora, stern. pelvis) smaller than tharus
④ Beak as broad as tharus but much less high.

B To cheriway – ① mean of legs of fossil about equal min. of cheriway
Except carpus & tarsus – all limb elements shorter than mean of tharus
2/10 1/12 7/10
wing bones of fossil are longer than those of min. cheriway.
mean

2 comparing mean of fossil to mean of cheriway fossil legs shorter than most, wings shorter but not much & carpus longer.

3 Body (cora, stern. pelvis) about same as cheriway (cora a bit smaller in comparing means tho min. cher. is less than mean of)

④ Beak broader than cheriway, much lower.

legs & body shorter than cheriway & cheriway mean
wings a little longer espec'ly carpus only 12/100 carpi fossil fall below mean of cheriway
74/100 of humerus-ulna, but 96 to 100/100 of
mean
leg bones fall below cheriway mean.

C To lutosus - ① mean & what is prob'ly the meaning lutosus
legs shorter, wings longer.
② Body (cora. sternum, pelvis) similar in size
③ Beak, narrower, & lower,
½ from 66 to 88% (ulna 82%) longer in fossil. (Leg bones) 80 to 88% (84. tibia) shorter in fossil
femur tarsus
Num. carpo 1

Fossil is smaller than cherinway in body and legs but with proportionately longer wings (falls below min. cherinway in all times but carpus & ulna, these are longer)

Fossil close in size to lutosus but with proportionately shorter legs & longer wings. Body size similar.

Fossil considerably smaller in body size than lutosus - also shorter in wing length - but legs proportionately longer. (also carpus & wing)

	actual body size	proportionate mean.
fossil & cherinway	smaller max. fossil close to mean of cherinway	wing - longer, particularly carpus * legs similar but tibia smaller ratio leg & wing less
fossil to lutosus	about equal	slightly longer wings, (& upper. carpus) shorter legs ratio leg & wing less
fossil & Thairus	smaller max. fossil equals min Thairus	carpus longer, tibia shorter, ratio wing & leg similar.

Caracara skeletons available for study

La Brea Fossils

Beaks	7	Humerus	68	Femur	50
Cranium	14	ulna	50	tibia	38
Sternum	2	Carpus	148	Tarsus	265
Pelvis	15	Radius			353
Scapula	10+		266		
Coracoid	153		211		
	201		353		
Mandible	10				
	211				

In a series of 35 tarsi (fossil), 9 forms that the most slender specimens (br. 9sh; dist. & prox. ends rel. to length) were found among the longest bones & the stoutest among the shorter; with however, a decided overlapping of long & short in the middle range of stoutness. The condition in modern caracaras is similar, tho not identical. Eight specimens of cheriway range in length from 87.5 to 97.4 mm with a break between the smallest & the next in size & approx 4 mm. This one smallest specimen is noticeably stouter than the other 7. Of 4 specimens of Tharus, one far exceeds the 3 others in length. This long one is much more slender than the 3 others.

Odd bits of information

6' fem'
65' – 12.1 ✓
65 – 11.0
62.6 – 11.6 ✓
68.6 – 11.2
69.4 – 11.9 ✓
70. – 11.8 ✓
70' – 10.8
70 – 10.5

length	% fem	% dist
94	13.8	
93	14.4	
92.4	14.0	
90.0	15.5	
89.7	14.8	
89.6	15.6	
88.0	15.0	
87.8	14.8	
87.4	14.8	
87.0	—	
86.3	15.5	
86.2	15.4	
85.5	16.3	
83.0	16.0	

from Miller 1925
p 100–101.

Measurements of "Chuckwalla" from Florida

	br.	Depth	br. shi. at comp. middle?			
Dirt Pond hum.	17.8 07	9.8				
dirt and hummocks	17.8	9.8?	8.0			
~~Ulna dirt~~	~~mach' br.~~	~~gr. brea~~	~~br. sh. in dirt half~~	~~depth from~~		
Ulna dirt	7.7	10.1	5.7	9.1		
"	8.0	10.2	5.9	9.0		
"	8.1	10.2	5.5	9.2		
"	7.6	10.3	5.7	9.1		
	br dist	br. sh. above dist				
tibia dist	13.0?	—				
"	—	6.7				
	br	depth				
femur dist	14.5+	11.3				
	br dist	br. shaft	br. mid. cond.	depth dist	dist. br. foramen	br. facet for M.
Tarsus dist	13.7	5.4	4.7	7.8	4.0	15.0
"	13.2	5.3?	—	8.7	3.5	15.7
"	—	5.1	—	—	3.3	14.3
"	—	—	4.6	—	3.0	14.9
	length	br. dist.	gr. br. dist	br. transv.	br. shaft	depth dist
complete Ulna	123?	8.0	10.7	11.9+	5.4	9.4

Distribution of
Modern species of Polyborus

cheriway

Tharus

Restricted on
Guadalupe I. only

Guadalupe Island

220 miles SW of San Diego 29°, 10' N, 118° 18' W.
15 miles long, 5 mis. max. width
altitude at highest pt. 4,513 ft.
170 mi from coast of L. Calif

Volcanic origin – lava burnt rock & broken lava

Northeast Northeast descending forest of pines on sharp ridge & south west side
few oaks here too.
on NW slope – far down large grove of cabbage palm.
Highest part (except Mt Augusta) grove of cypresses on west slope
below on
East side of this ridge is plateau with small cypress grove
Sage brush all over island

Buteo borealis
Falco sparverius
Falco rex?
Polyborus lutosus
Speotyto cunicularia
Colaptes rufipileus
Microsyra melanoleuca Note Thrasher swift woodpecker hummer
Trochilus anna
Carpodacus amplus
Junco insularis
Oreoptes montanus
Salpinctes obsoletus
Merula migratoria

Guadalupe Wren
Sitta canadensis – Nuthatch
Regulus obscurus – Kinglet
Hermit Thrush
West. Robin
Thrush
Bluebird

Larus occidentalis
Puffinus (Black-vented)
Oceanodroma leucorhoa
Diomedea albatrus gambeli
Sturnella neglecta
Loxia curvirostra stricklandi
Zonotrichia coronata
Junco hyemalis
Junco insularis chipping sparrow
Spizella socialis
Melospiza lincolni
Passerella iliaca
Pipilo consobrinus
Cedar waxwing
Lanius ludovicianus
Dendroica auduboni
Anthus pensilvanicus
Mimus polyglottos
Salpinctes guadeloupensis

Upper Calif.
Lower Calif.
Sinaloa
Sonora
Arizona S.W.
Louisiana
New Mexico
Texas
Indian Territory
Utah
Nevada
Upper Calif.
Lower Calif.
Guayaquil
Ecuador on west
Venezuela
British Guiana on east
Colombia
Cuba
Trinidad
Santa Margarita Is.
Magdalena Bay
Lower Calif.
N to 20°
Above that - Santo Domingo, San Ignacio
St. Catharine, Colo. delta
Mississippi U.S. boundary

Thence down
Paraguay Bolivia, So. Brazil & Straits of May.
Chile
Patagonia
Araucania
Tierra del Fuego
Straits of Magellan
Hermit Islands
Gulf of Mexico
Rio de Janeiro
Lower Calif. North of 20°

Antilles
Guadeloupe Is.
Martinique
Porto Rico

For comparison with La Brea

Polybonus cheriway — 5 complete, 4 incomplete skeletons from Nat'l Zool Park, Wash; Florida, Mexico, Salvador, Guatemala Central America; & Colombia S. Amer. Colls. U.S. Nat Mus., Berg Mills & L.A. Museum.

Polybonus plancus — 4 complete skeletons from Patagonia, Argentina So. America. Colls, U.S. Natl Mus. Berg Mills & L.A. Mus.

P. lutosus — 1 complete skeleton from Guadalupe Is. Coll. U.S. Nat. Mus.

P. latebrosus — Type caipometacarpus Cab. Rico Coll. Amer. Mus. Nat. Hist.

LACM

Bi 1231 ♀ Mexico Body

Bi 8038 ♂ " Humeri

Bi 7387 ♀ Guatemala Body

Bi 1043 ♀ ~~Sonora~~ Mexico incomplete fem skin

Bi 12206 ♂ " complete

Bi 7397 ♀ Guatemala "

Bi 420 ♀ Colombia odd bones fem old skin

Bi 236 ♀ Chubat, S. Am. nearly complete — thorax

Lay Miller 206 ♀ Argentina, S. Am. complete Pleurons (Thorax)

Lay Miller 7368 ♂ Salvador, Central Amer. " } Sternum L. Miller

Lay Miller 355 ♀ " " " Body }

USNM 184556 ♀ complete USNM

USNM 18478 Straits Magellan S. Amer. "

USNM 322338 ♀ Zool Park Wash. "

USNM 321805 ♀ " " " "

USNM 19670 ♀ Florida "

USNM 19671 " "

Species	number of skeletons	collection of
Polyborus cheriway	2 complete skeletons Nat'l Zool. Park., Washington	U. S. Nat. Mus.
	2 complete skeletons Florida	
	1 complete skeleton Salvador, Central Amer.	Faye Miller
	1 complete, 1 ~~bird~~ skeleton Guatemala, Central amer.	L. A. Mus.
	1 complete, 2 inc. skel Mexico	
	1 incomplete Colombia, S. Amer.	
Polyborus plancus	~~1 complete~~	U. S. Nat. Mus
	2 complete ~~Straits of Magellan~~ Patagonia S. Amer.	
	1 complete Argentina	Faye Miller
	1 complete Argentina	L. A. Museum.
P. lutosus	2 complete Guadelupe Is.	U. S. Nat. Mus.

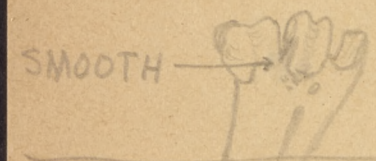
Tarso-metatarsus

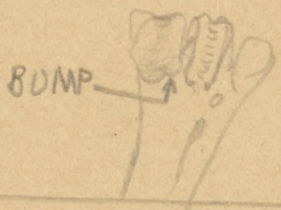
Comparisons Thanis + cheiroway
Charts made by Assistant geo. Huston

Thanis

cheiroway

Trochlear for digit 4 –





Shaft is thick + short

Shaft is thin + long

Anterior larger on Thanis

smaller in cher,

4422
10.9 ab
12 cd
84 l

E1095
14.1 ab
14.4 cd
89.9 l

E4139
11.2 ab
12.3
83.4

1416
12.1 ab
12 cd (broken)
86.1 l

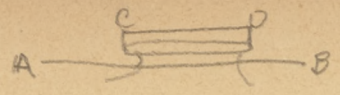
1009
12.4 ab
12.4 cd (br.)
89.4 l

7
5.7

E1654
11.9
12.8
87.7

1545
10.5
11.8
89.3

797
12.6 ab
12.3 cd (broken)
92.1 l



T

AB

(206) 13 mm

(236) 12.7 "

(206) broken 12.6 "

length 88.4 (236)

89.4 (206) not broken

AB C

(736) left
12.8 ab
94.9 long
14.1 cd

~~Bi 420~~

(739)
13.2 ab
96.6 long
13.8 cd

(1049) left
12.1 ab
97.2 long
13.8 cd

(1043) right
12 ab
13.8 cd
99.5 long

(739)

Mandible

Thames

no.	a	b	b/a	c	d	c/d	e	e/a
236	15.3	11.3	73.9	9.6	61.5	15.6	5.8	37.9
206	14.9	11.8	79.3	11.8	63.7	18.5	6.1	40.8
18456	15.0	11.9	79.5	9.6	63.9	15.1	6.3	42
18478	16.3	11.7	71.8	11.6	69.8	16.7	7.2	44.2

Chariway

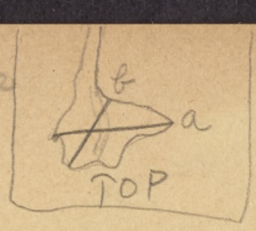
no.	a	b	b/a	c	d	c/d	e	e/a
736	14.6	9.6	65.7	12	66.7	18.1		
1043	15.5	10.5	67.8	11.7	70.5	16.6		
420	14.8	9.9	66.8	10.4	65.2	15.9	5.8	39.2
739	15.2	10	65.8	12.6	68	18.5	6.0	39.4
19640	14.9	11.1	74.6	11.8	66.2		5.9	39.6
321805	15.3	11.7	76.5	diseased			6.4	41.8
322338	14.8	10.6	71.7	11.4	67.6			
19671	15.1	10.7	71.8	10.3	66.5			

Unknown

no.	a	b	b/a	c	d	c/d
✓ 9094	14.4	10.3	71.6			
✓ 9093	14.2	11.2	79			
F 2675	14.3	10.1	70.8			
F 2674	14.4	9.9	68.8 (?)	8.8	61.1	14.4
✓ 9095	13.6	9.5	69.8			
F 2676	15.5	11.4	73.7			
F 2715	18.3	9.4	70.7			
F 2678	13.4	9.4	70.2 (?)			
F 2713	broken			8.9	60.9	14.6
F 2719	broken			8.5	60.5	14.4

T Mandible

no.	a	b	b/a
236	15.3	11.3	73.9
206	14.9	11.8	79.3



C.

no.	a	b	b/a
736	14.6	9.6	65.7
1043	15.5	10.5	67.8
420	14.8	9.9	66.8
739	15.2	10	65.8

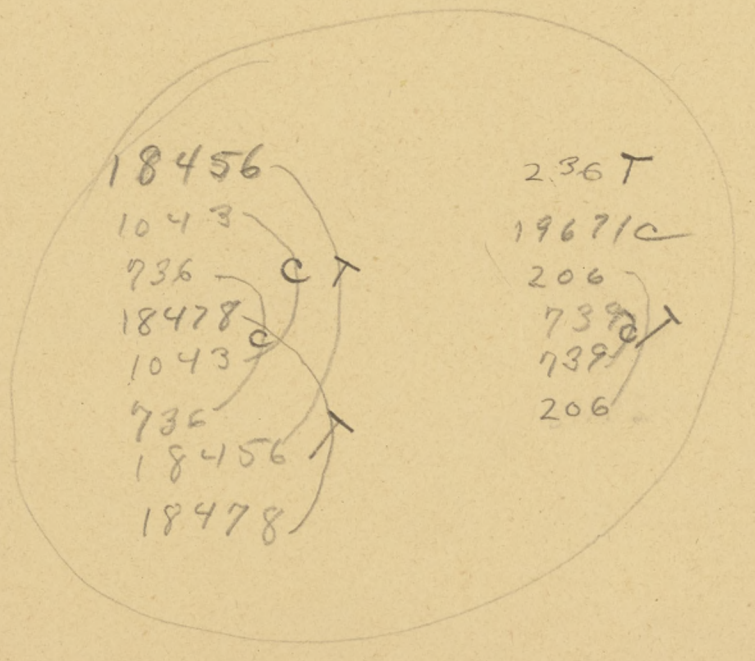
Unknown

no	a	b	b/a
J. 9094	14.4	10.3	71.6
J. 9093	14.2	11.2	79
F 2675	14.3	10.1	70.8
F 2674	14.4	9.9	68.8 (?) (slightly broken)
J 9095	13.6	9.5	69.8
F 2676	15.5	11.4	73.7
F 2715	13.3	9.4	70.7
F 2678	13.4	9.4	70.2 (?) (broken)

notch

Carpo Metacarpus

In the La Brea birds there seem to be 3 divisions or possibly 2 using the notch, shown in the drawing, for identification. Of 239 specimens, 192 had little or no notch, 40 had a sharp, deep notch, and 7 instead of a notch had a hole. The second type may have had a hole the side of which is broken or worn smooth. The modern bones have a deep notch & cartilage forming the hole. In the La Brea birds the cartilage has possibly ossified forming the hole. This might be an indication of age or of species.



no notch	deep notch or hole
18456 T	236 T
18478 T	739 T
1043 C	19671 C
736 C	739 C

Coracoid

Coraco-humeral surface is thicker & heavier in Thamn

Humerus

206

Thams

115.4 mm. long

bicipital furrow rounded out

brachialis anticus impression same depth for whole length

ectepicondylar prominence

?

nutrient foramen is long slit.

?

deltoid crest rises abruptly

This spot almost perpendicular to shaft

bicipital surface enters shaft at angle

736

Cheiway

108.2 mm. long

bicipital furrow pronounced. Comes to point at distal end.

brachialis anticus impression deep at dist. end. Gradually shallows smoothly into shaft

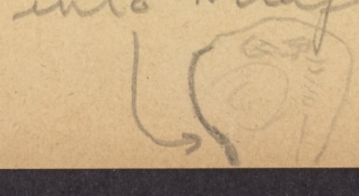
ectepicondylar prominence

nutrient foramen is nearly round hole

deltoid crest rises smoothly

This spot is almost parallel to shaft.

bicipital surface tapers into shaft.

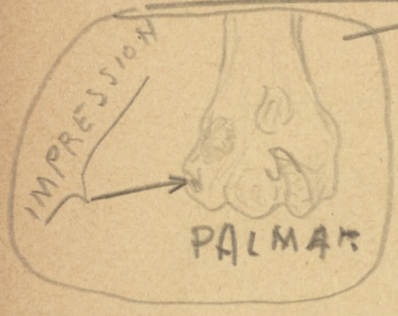


Average Ratios

ratio of:	Tharnis	Cheriway
length to AB	4.058 to 1	4.86 to 1
length to CD	5.9455 to 1	6.245 to 1
length to EF	6.17 to 1	6.015 to 1
AB to CD	1.30 to 1	1.2875 to 1
AB to EF	1.3475 to 1	1.2385 to 1
CD to EF	1.0375 to 1	.96 to 1
	3.4134($\frac{1}{6}$) to 1	3.43434 to 1

236

Thanus



This impression faces toward palmar side of bone

Cheriway

This impression face towards left side of bone

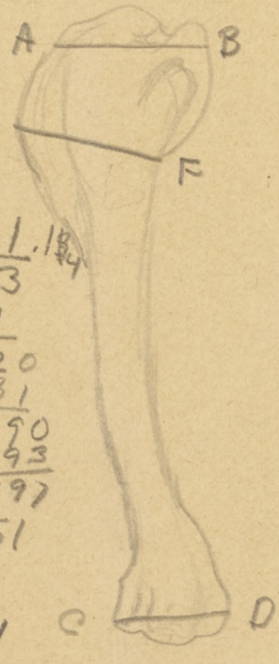
deltoid crest shaped like this.

deltoid crest shaped like this

facet on internal tuberosity longer shallow

facet deeper almost round

distance A-B - 26.3mm
C-D - 20.1 "
E-F - 19.4 "



distance A-B 23.1 mm
C-D 17.7 "
E-F 17.8 "

108.2 | 115.4 = 1.067
1082
7200
6492
708

23.1 | 26.3 = 1.14
231
320
231
890
693
197

ratio of lengths 1.07 to 1

ratio of A-B 1.14 to 1
C-D 1.13 to 1
E-F 1.08 to 1

	Thasus		Cheriwan	
	206	236	736	739
ratio of length to A-B	4.39	4.77	4.68	5.04
" to C-D	5.741	6.15	6.11	6.38
" to E-F	5.95	6.39	6.08	5.95
AB to C-D	1.31	1.29	1.305	1.27
" " AB to E-F	1.355	1.34	1.297	1.18
CD to EF	1.035	1.04	.99	.93

length	I.	C.
AB	24.1	22.8
CD	18.7	18
EF	18	19.5

Thairs

(Angle of trapezoid surface to shaft)

Cheirway

✓E 1918
✓E 3526
✓E 3372
~~E 3814~~

E596
✓E 2552 ?
✓E 2517
✓E 3927
✓E 1441
✓E 3925
✓E 1318 ?

E1805
✓E9558

✓E 9561
E 9852
✓E 3864 ?
✓E 3084 ?

E 3490
✓E 1510
✓E 9847
✓E 1804
✓E 704
E 4375
✓E 3255
✓E 590
✓E 1312
E 2614
✓E 4795
✓E 4398
✓E 1088
✓E 877
E 1327
✓E 1620
✓E 588

E 3490 ?
9852
4375 ?
1805
596
1327
2614

brachialis anticus impression

Thorius

E 2552
E 1327
E 4375 ?

E 3490 ?

E 9558
E 2614
E 1318
E 1441
E 3372
E 9852
E 3925
E 3524
E 1918
E 3927
E 2517

Cheiroxys

E 4795 ?

E 9847
E 4398
E 588
E 3255
E 9561
E 877
E 3864
E 1312
E 594
E 704
E 590
E 1805
E 1510
E 3084
E 1804
E 1620
E 1088

Pit 4 - Polyboros

Humerus	104.6	114.3	109.1
Ulna	115.7	121.6	118.1
Carpus	59.2	66.8	63.2
	279.5	302.7	290.4
Coracoid	44.3	50.0	47.4
Femur	61.7	68.3	64.9
Tibia	100.5	112.3	107.1
Tarsus	81.9	93.6	88.4
	244.1	274.2	260.4

	Fossil			/	Resemblance to Recent
Ratio leg & arm	87.4	90.4	89.6		thamus
Ratio co. Hum.	42.3	43.7	43.4		lutosus to thamus
Ratio cor. Hum.	54.0	53.4	53.4		churinga + ? (lutosus?)
Ratio cor. to carpus	74.8	74.8	75.2	—	milleri - nearest lutosus, then thamus

Thanus

Chemway — lined in series by length

numbers of individuals

	femur	tibia	femur	leg	carpus	ulna	humerus	wing	Ratio: leg / wing	Ratio: femur / humerus	Ratio: tibia / humerus	Ratio: carpus / femur	Ratio: carpus / tibia	Ratio: carpus / ulna	Ratio: carpus / wing	carpus
Chemway	97.1	118.8	93.2	289.1	63.4	122.8	115.0	300.2	96.3	84.4						53.0
	96.6	117.8	72.0	286.4	62.6	121.8	114.9	299.3	95.6	84.1						51.3
	96.1	117.0	71.2	284.3	62.2	121.5	114.6	298.3	95.4	83.9						50.5
	96.0	115.7	70.9	282.6	61.3	121.1	114.0	295.9	95.6	84.3						50.1
	95.6	115.2	70.0	280.6	61.3	120.5	113.1	293.3	95.6	83.7						49.3
	94.5	114.7	69.8	278.9	60.8	116.7	111.7	288.5	96.6	84.6						49.2
	93.5	114.5	69.7	274.5	60.2	115.8	110.4	284.7	96.5	84.5						48.8
	91.4	112.6	68.4	271.2	57.0	112.7	109.8	281.9	96.3	83.4						48.3
	87.8	111.8	68.0	260.2	—	109.1	108.5	270.3	96.4	81.3						45.8
		109.7	65.2				107.8									4467
	94.7					1179										
9	848.6				9)	10618	104.2									
	81															
	38															
	342															
	342															
Thanus	88.3	107.8	67.6	263.7	63.1	119.9	115.0	298.0	88.4							
	89.4	108.8	68.3	266.5	63.6	121.9	115.3	300.8	88.6							
	90.1	111.9	70.5	272.5	63.7	122.9	116.3	302.9	90.0							
	101.7	122.1	79.8	303.6	69.5	132.5	128	330.0	91.8							

	tarsus	tibia	femur	carpus	ulna	hum.	cora.
min. fossil to min. cheriway	93.2%	93.4%	94.8%	103.6	102.1	96.4 97.9	95.0%
max. fossil to max. cheriway	97.7%	94.6%	98.6%	107.0%	99.6%	100.2	97.5%
mean fossil to mean cheriway	93.9%	92.8%	94.4%	103.2%	98.7	98.2	94.7%
mean fossil to luteus	96.0%	97.9%	97.0%	103.2%	102.4%	101.0%	99.7%
mean fossil to min. tharus	100.1%	98.6%	97.5%	100.1%	97.1%	95.2	93.2
max. fossil to mean tharus	102.9%	99.9%	101.8%	104.5%	98.5%	97.4%	97.6
mean fossil to mean tharus	96.0%	94.4%	92.2%	93.7%	93.5%	92.4	91.9

nelumbo fossil cavicavi beath sternum br brainard cranio tr. back of greatest spread

57.0
52.2
54.1
55.6
58.2
54.1
58.7
59.0
58.0
55.8
58.8
56.6
61.4
59.4
57.1
58.7
58.4
56.7
54.6
50.7
54.2

21) 1196.5 (57.0
105
146
126
205
189
140

22.2
20.3
21.
23
24
20.2
6) 130.7
21.7

72.3
64.2
70.3
73.0
69.1
73.2
69.1
72.2
70.1
69.4
66.4?
66.7
76.4
68.4
64.6

15) 1050.9 (70.0
105

30.0
38.2
34.2
38.5?
38.8
38.6
37.7
38.2
37.1
38.3
38.7
34.0
34.3
38.2
37.6
38.9
36.6

32.8
33.2
33.0
33.9
33?
31.9
32.9
33.2
32.6
33.0
33.0
32.9
33.9
32.9
32.1
33.4
31.7

50
51.9
49.1
49.3
49.8
53.0
52.1
49.4
50.8
51.0
49.9

14) 690.9 (38.3
54
150
149
09

14) 626.8 (32.9
57
56
38
180

11) 555 (50.4
55
75
75
53

50.4
95
2520
41.3
47880

32.9
95
1645
2961
31.233

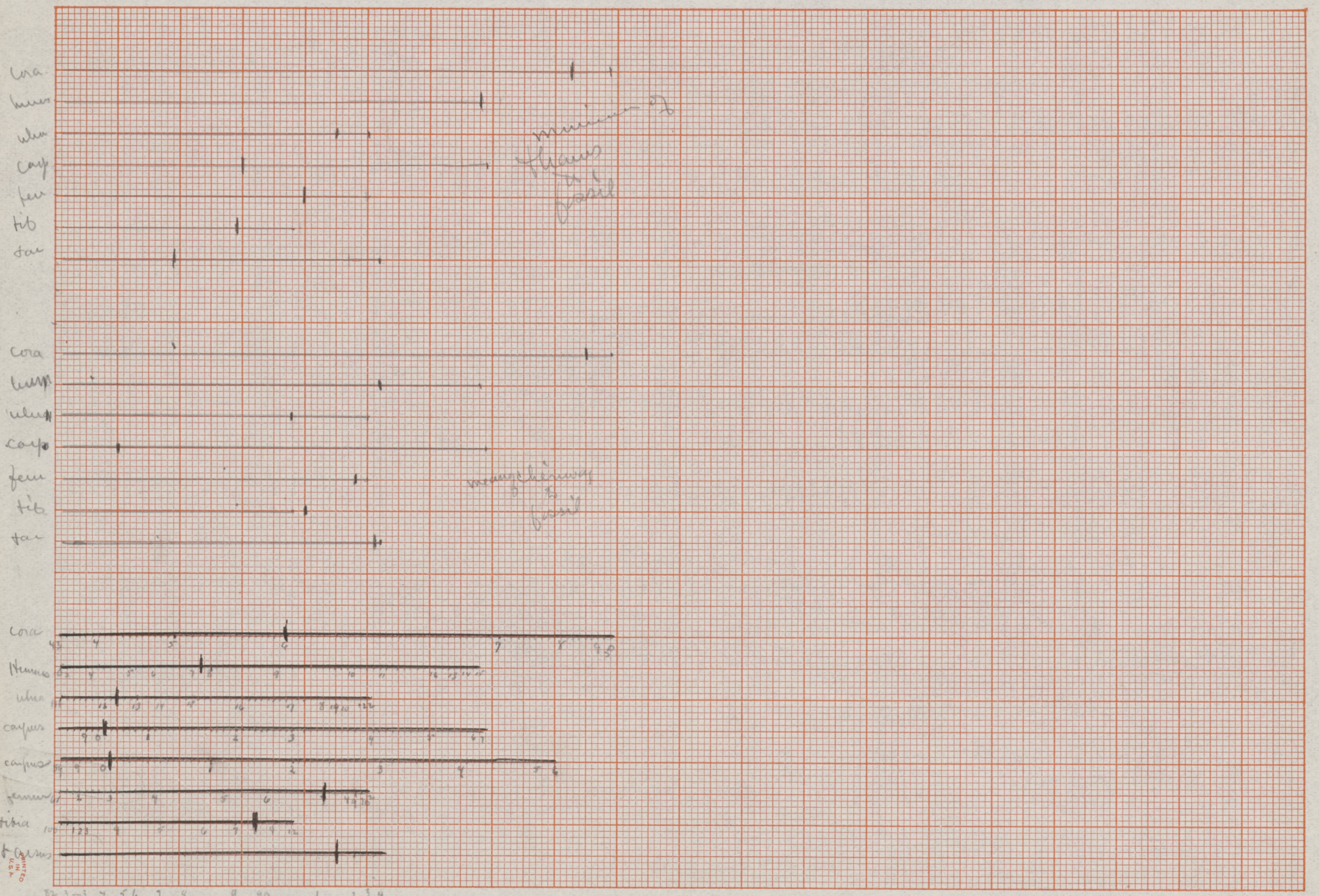
103.5
31.2
7245
1035
3105
32.805

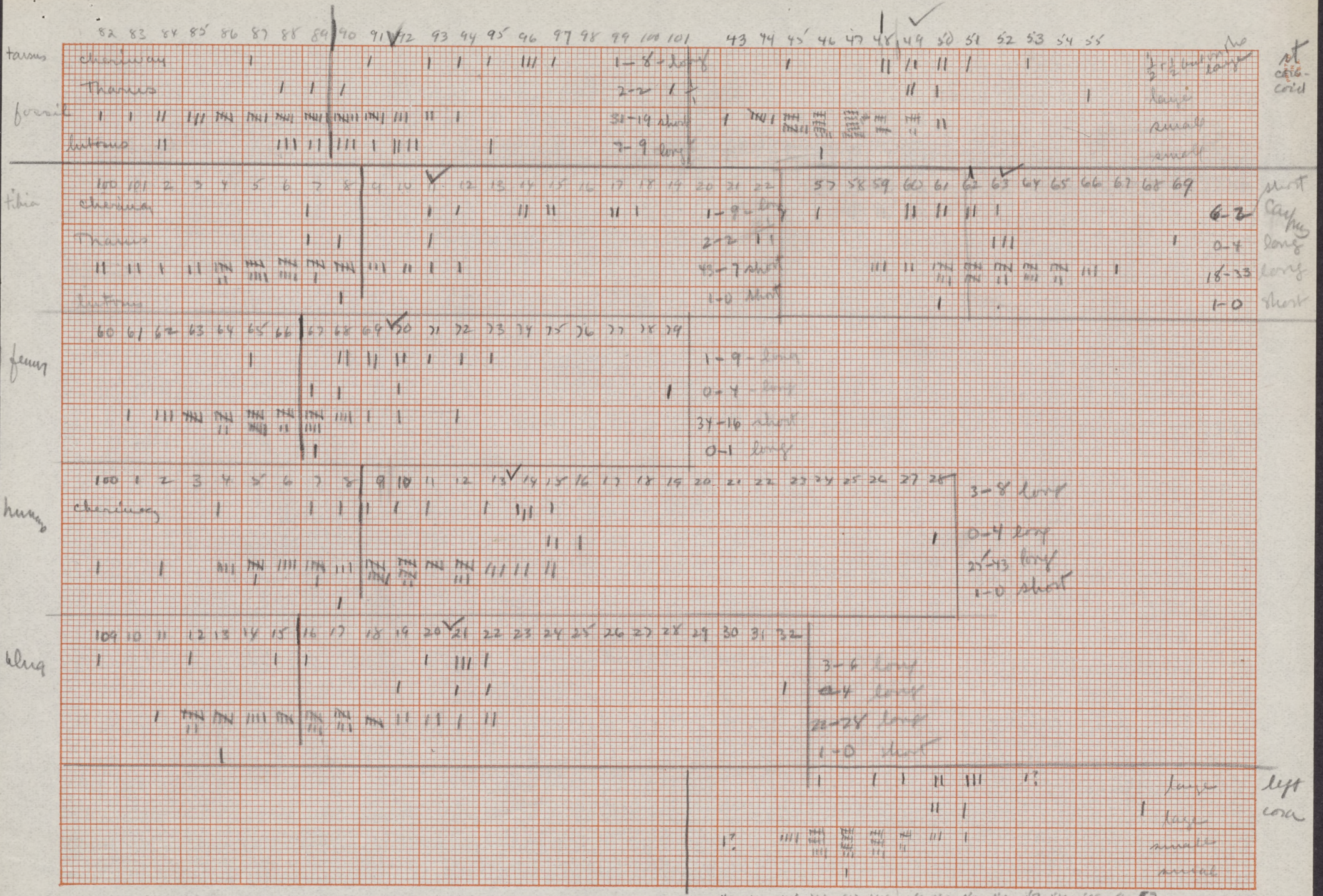
52.6
33.2-63
52.6
70.5
48.4
51.6

83.5 90 63.2
76.6 63.2
67.6 90 50.6
76.4

489
1035
2445
1969
4.89
50.61

CHARLES BRUNING COMPANY, INC. NO. 700-20
20 x 20 to the inch.
PRECISE DATA SHEETS




tarsus
chamiwaq
Thamnes
fossil
luteus
tibia
chamiwaq
Thamnes
luteus
femur
chamiwaq
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chamiwaq
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left coxa
long
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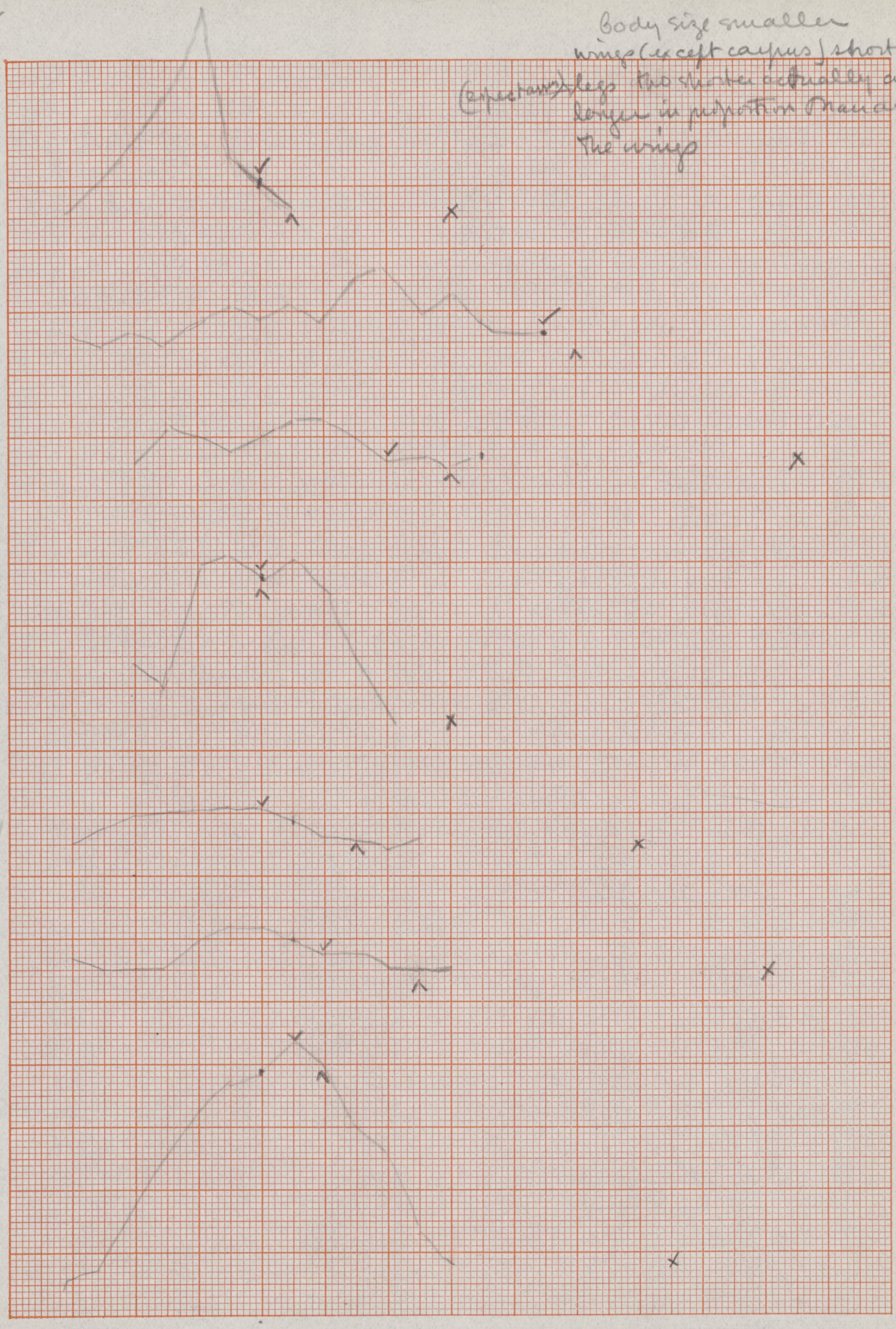
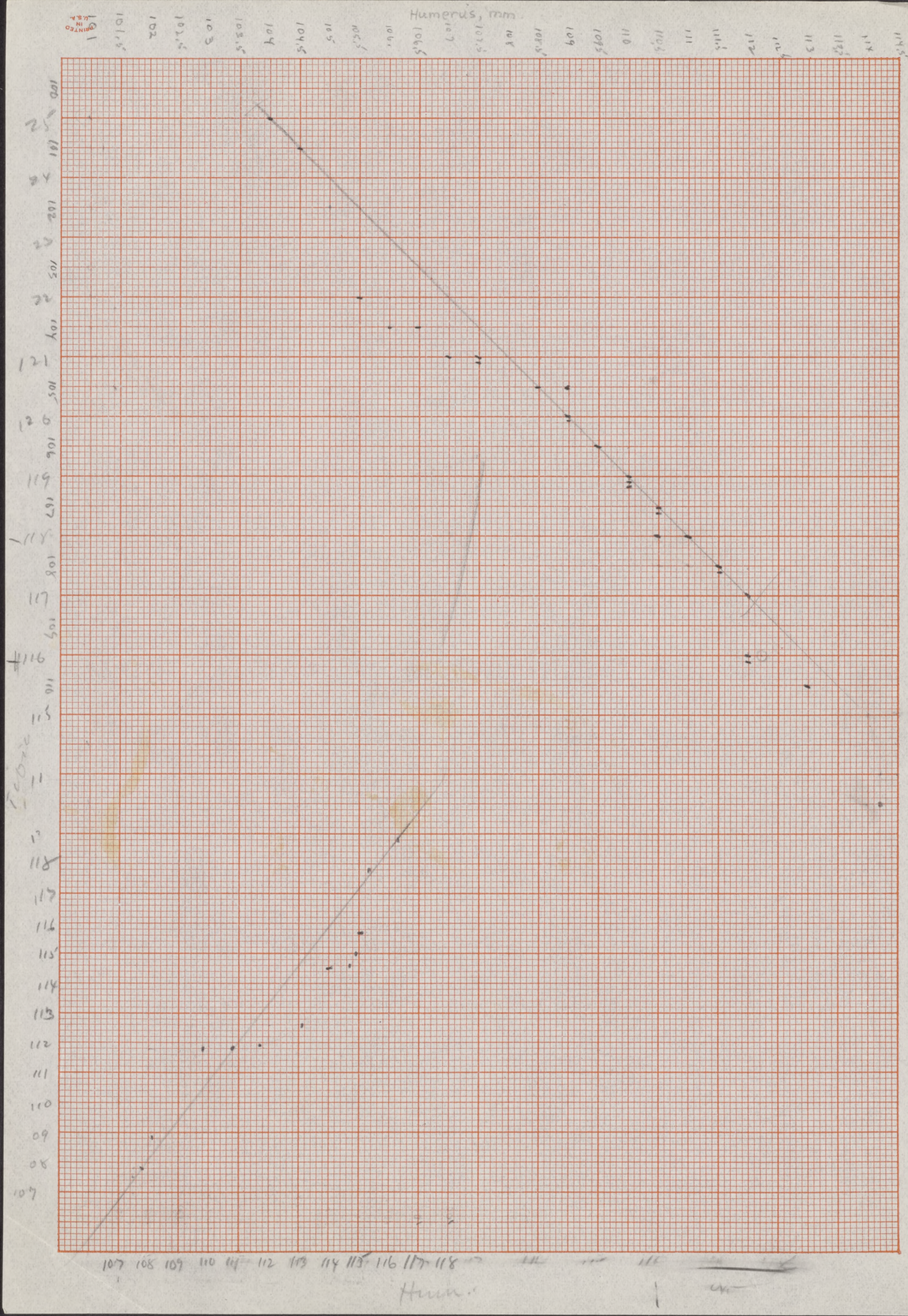
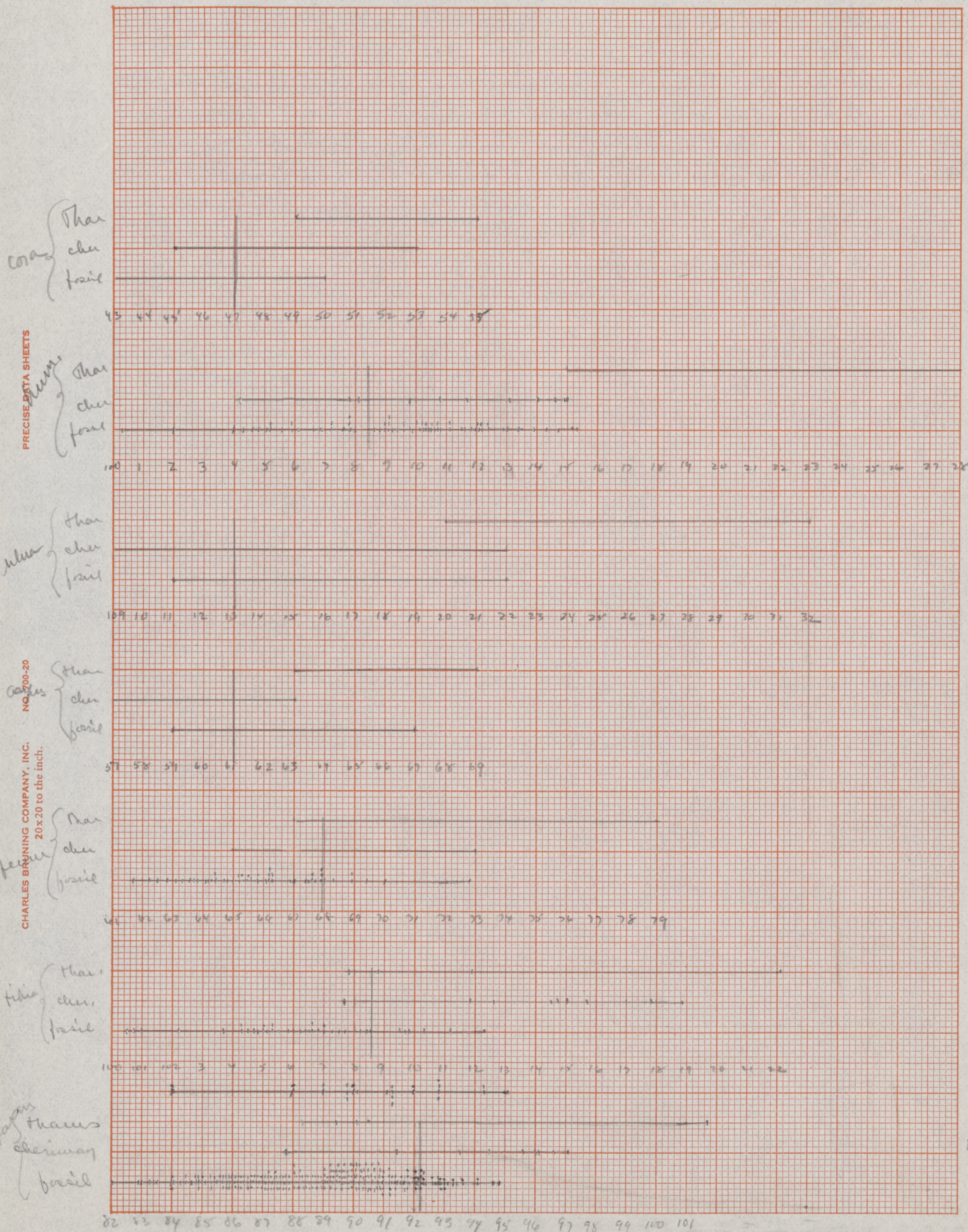
long
short
long



PRECISE DATA SHEETS
CHARLES BRUNING COMPANY, INC. NO. 700-20
20 x 20 to the inch.
PRINTED IN U.S.A.



CHARLES BRUNING COMPANY, INC. NO. 700-20
20 x 20 to the inch.
PRECISE DATA SHEETS



PRECISE DATA SHEETS
CHARLES BRUNING COMPANY, INC. NO. 200-20
20x20 to the inch.
PRINTED IN U.S.A.

Mossil to Intermediate

Body size the same
Legs used to be short
Wings ↓ ↑ ↓ longer

Rt. Carpal

Humerus

ulna

Carpus

Femur

Tibia x

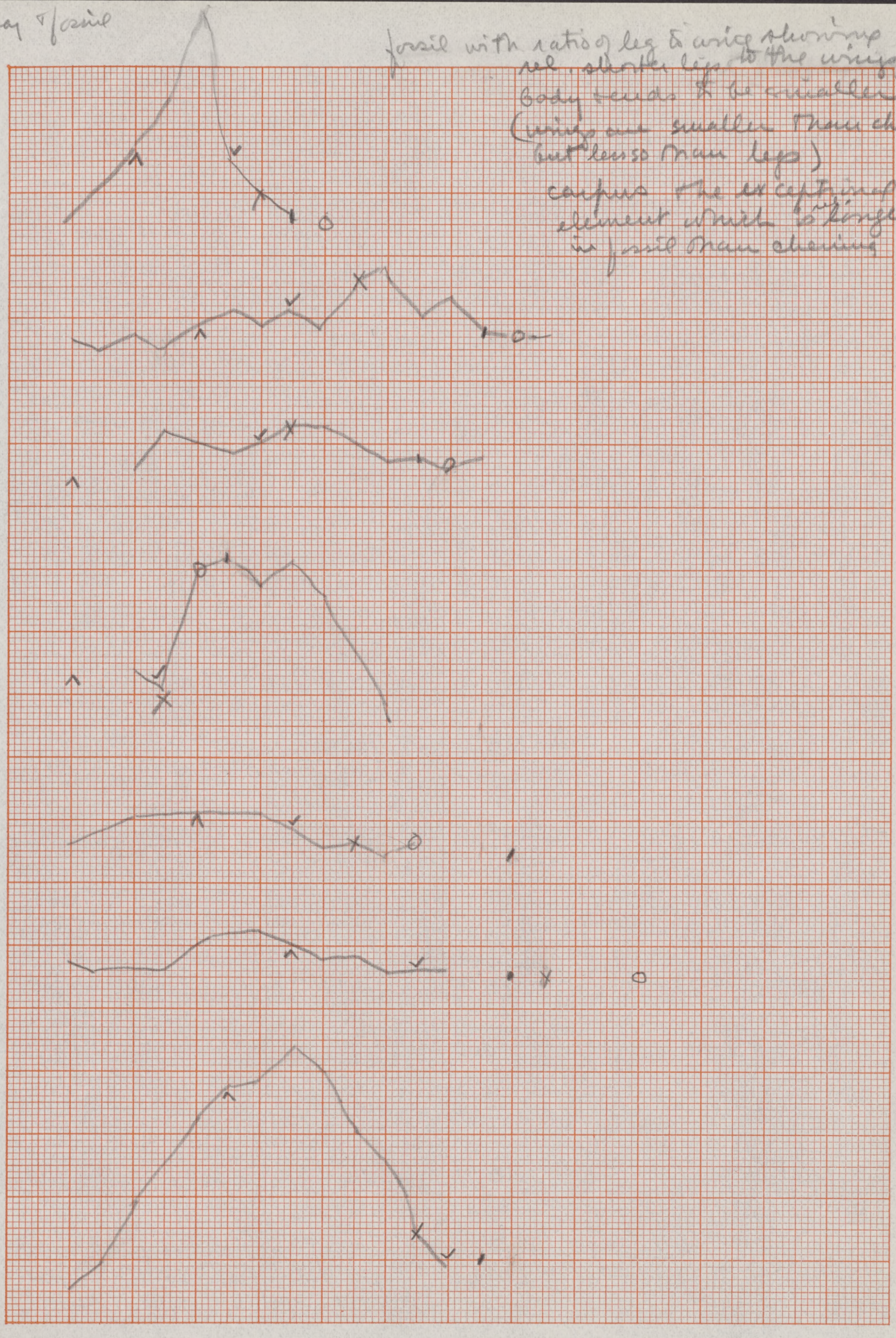
Tarsus

O

PRECISE DATA SHEETS
NO. 700-20
CHARLES BRUNING COMPANY, INC.
20x20 to the inch.
PRINTED IN U.S.A.

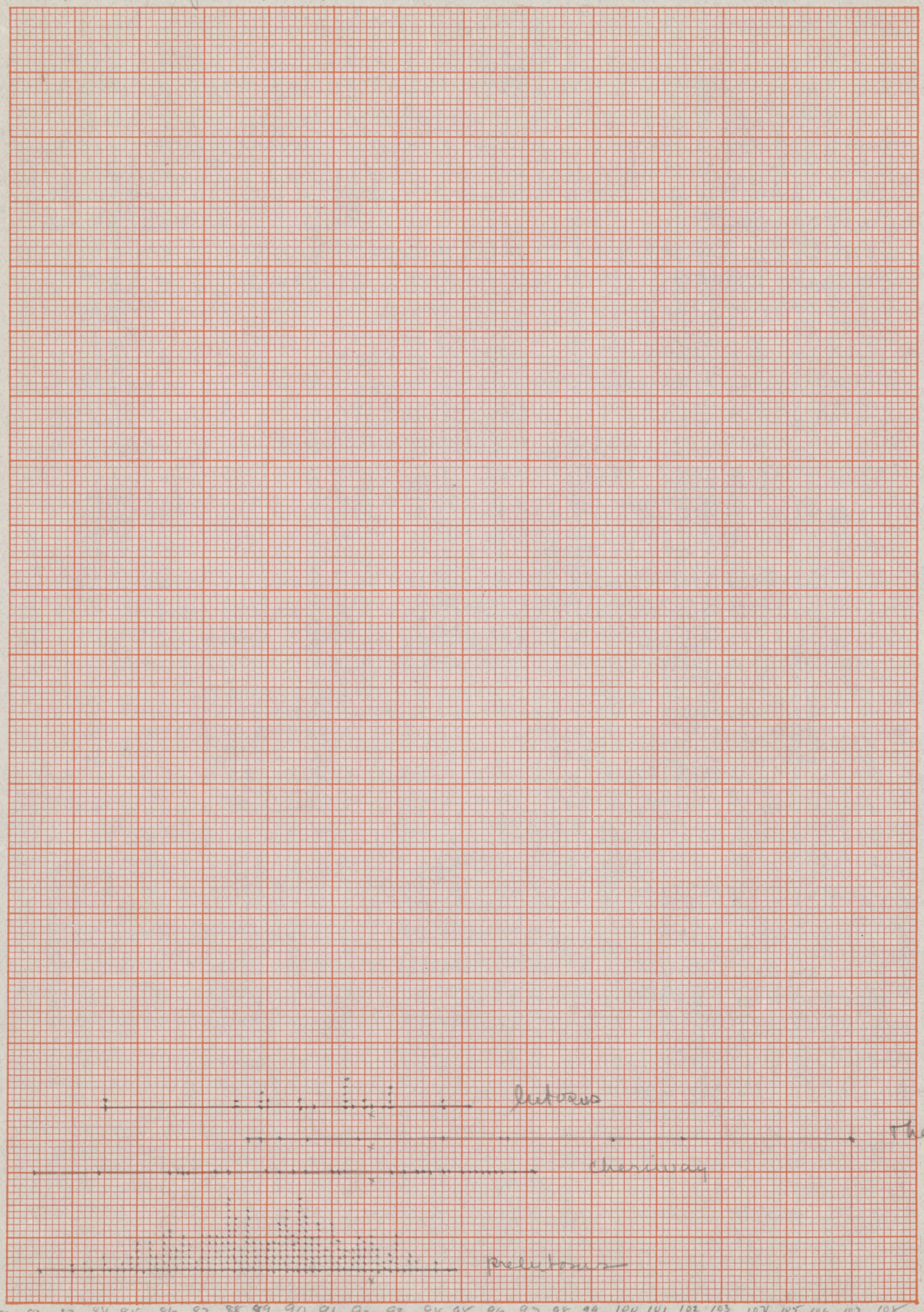
chewing fossil

fossil with ratio of leg to wing showing rel. shorter legs to the wings
Body tends to be smaller
(wings are smaller than chewing but less so than legs)
carpus the exception element which is longer in fossil than chewing



PRECISE DATA SHEETS
CHARLES BRUNING COMPANY, INC. NO. 700-20
20 x 20 to the inch.
PRINTED IN U.S.A.

July 9, 1937



Taurotragus skins & skeletons combined

CHARLES BRUNING COMPANY, INC.
20x20 to the inch.
NO. 700-20
PRECISE DATA SHEETS

fossil Polybous
leg & wing

50 Carpometac.	50 Humerus	50 Wing
57.8	109.9	100.3	268.0
59.1	111.5	102.0	272.6
59.3	112.1	104.0	275.4
59.5	112.2	104.3	276.0
60.2	112.2	104.7	277.1
60.7	112.2	105.2	278.1
61.0	112.3	105.6	278.9
61.2	112.4	105.9	279.5
61.3	112.7	105.9	279.6
61.5	113.1	106.1	280.7
61.6	113.6	106.6	281.8
61.7	113.7	106.8	282.2
61.8	113.8	106.9	282.5
61.9	113.8	107.2	282.9
62.0	114.1	107.4	283.7
62.0	114.4	107.8	284.2
62.1	114.4	107.8	284.3
62.2	114.7	108.0	284.9
62.4	115.5	108.7	286.6
62.5	115.7	109.0	287.2
62.8	115.7	109.0	287.3
62.8	115.8	109.1	287.5
62.8	115.9	109.1	287.8
62.9	116.0	109.2	288.1
63.0	116.4	109.6	289.0
63.2	116.4	109.8	289.4
63.3	116.5	109.9	289.7
63.4	116.6	110.1	290.1
63.5	116.7	110.2	290.4
63.7	116.9	110.3	290.9
63.8	116.9	110.3	291.0
64.0	117.0	110.4	291.4
64.0	117.0	110.5	291.5
64.1	117.1	110.6	291.8
64.2	117.1	110.7	292.0
64.4	117.3	110.8	292.5
64.5	117.3	111.1	292.9
64.6	117.5	111.5	293.6
64.7	117.9	111.6	294.2
64.9	118.2	111.8	294.9
65.0	118.7	112.0	295.7
65.3	118.8	112.1	296.2
65.4	118.8	112.1	296.3
65.4	118.9	112.2	296.5
65.5	119.2	112.4	297.1
65.7	119.7	112.9	298.3
65.9	120.0	113.4	299.3
66.2	120.1	113.9	300.2
66.4	121.6	114.3	302.3
66.8	122.0	114.7	303.5
67.8	122.3	115.2	305.3

265 Tarsus	50 Tibia	50 Femur	Leg.	Ratio
81.9	100.5	61.7	244.1	91.2
82.8	100.5	61.7	245.1	89.9
83.9	100.7	62.2	246.8	89.7
84.6	101.0	62.5	248.1	89.8
84.9	101.5	62.8	249.2	89.8
85.3	102.2	63.1	250.6	90.3
85.6	103.0	63.3	251.9	90.7
85.8	103.7	63.6	253.1	90.6
86.0	104.3	63.7	254.0	91.0
86.2	104.3	63.8	254.3	90.4
86.4	104.4	64.1	254.9	90.4
86.6	104.5	64.2	255.3	90.4
86.9	104.6	64.3	255.8	90.4
87.1	104.7	64.4	256.2	90.4
87.3	104.8	64.4	256.5	90.6
87.5	105.0	64.7	257.2	90.8
87.7	105.0	64.8	257.5	90.5
87.7	105.1	65.0	257.8	90.5
87.8	105.3	65.2	258.3	90.4
88.0	105.3	65.2	258.5	90.2
88.2	105.4	65.3	258.9	90.5
88.3	105.5	65.3	259.1	90.4
88.5	105.7	65.4	259.6	90.4
88.7	105.8	65.5	260.0	90.4
88.9	106.0	65.5	260.4	90.0
89.1	106.2	65.6	260.9	90.3
89.3	106.3	65.8	261.4	90.4
89.3	106.4	65.8	261.5	90.0
89.4	106.5	66.1	262.0	90.2
89.6	106.6	66.2	262.4	90.1
89.7	106.6	66.2	262.5	90.3
89.9	106.7	66.2	262.8	90.3
90.0	106.8	66.3	263.1	90.4
90.1	107.0	66.3	263.4	90.3
90.2	107.0	66.4	264.1	90.6
90.3	107.3	67.0	264.6	90.5
90.4	107.4	67.1	265.2	90.4
90.5	107.5	67.5	265.5	90.4
90.8	107.7	67.6	266.1	90.6
91.0	108.0	67.6	266.6	90.3
91.2	108.2	67.7	267.1	
91.3	108.4	67.9	267.6	
91.5	108.5	67.9	267.9	
91.8	108.5	67.9	268.2	
91.9	109.0	68.0	268.9	
92.2	109.3	68.3	270.0	
92.5	109.7	68.9	271.1	
92.8	110.2	68.9	272.0	90.8
93.0	110.5	69.4	272.9	90.3
93.3	111.2	70.0	274.5	90.4
94.2	112.3	72.8	279.3	91.5

91.7 :)

43) 3687.1 (90.1
358
119.1

getting ratios by groups smoothes off the extremes. In fossil, therefore, allow for slightly greater extremes than shown up here

leg & wing by groups			by individuals
95.6–96.6	—	cheriway	95–97
88.4–92.0	—	Thanus	88–92
~~90.11~~ 89.3 – 91.6	—	fossil	(88.5 – 92.5? – calculated)
		lutosus	95

cheriway

tarsus	tibia	femur	total	carpus	ulna	humerus	total	ratio
91.4	111.8	68.0	271.8	60.2	112.7	107.9	280.8	96.4
93.5	112.6	69.7	275.8	60.8	115.8	109.8	286.4	96.2
94.5	114.6	69.8	278.9	61.3	116.7	110.8	288.8	96.4
95.6	115.0	70.0	280.0	61.3	120.3	111.7	293.3	95.6
96.0	115.7	70.9	282.6	61.4	121.1	113.1	295.6	95.4
96.1	117.0	71.2	284.3	62.2	121.5	114.0	297.7	95.5
96.6	117.8	72.0	286.4	62.6	121.8	114.6	299.0	95.6
97.1	118.8	73.2	289.1	63.4	122.8	115.0	301.2	95.9

Thanus

88.3	107.8	67.4	263.7	63.1	119.9	115.0	298.0	88.4
89.4	108.8	68.3	266.5	63.6	121.9	115.3	300.8	88.6
90.1	111.9	70.5	272.5	63.7	122.9	116.3	302.9	90.1
101.7	122.1	79.8	303.6	69.5	132.5	128.0	330.0	92.9

Species	tarsus	tibia	femur	leg	carpus	ulna	humerus	wing	coracoid (abnormal)	sternum	length vert. to pelvis	beak Br	beak Kt
Cherivay													
196708 ♂	96.1	115.0	71.2	282.3	62.6	121.8	114.0	298.4	—		—	12.6	15.9
321805 ♀	96.0	117.8	73.2	287.0	61.3	121.1	114.6	297.0	51.3 left + 53.0 rt			—	—
322338 ♀	-93.5	115.7	70.0	279.2	60.8	116.7	109.8	287.3	50.3 left + 49.2 rt		—	12.6	—
196710 ♂	-95.6	+114.7	70.9	281.2	62.2	120.3	113.1	295.6	+ 50.5 rt. 51.1 left	70.6	57.5?	13.0	14.6
739 ♀	96.6	118.8	72.0	287.4	61.3	121.5	114.9	297.7	51.9 left + 51.3 rt	73.0	60.8	13.0	15.6
736	-94.5	-111.8	68.0	274.3	60.2	115.8	107.8	283.8	49.2 left + 48.8 rt	70.2	60.5	12.3	14.8
12208 ♂	-87.8	-107.7	65.2	260.7	57.0	109.1	104.2	270.3	46.3 left + 45.8 rt	65.5	55.5	12.5	15.3
1043	97.1	117.0			63.4	122.8	115.0	300.2				12.8	15.8
420	-91.4	+112.6				112.7						13.5	15.6
738			69.8				110.8		50.0 left + 49.3 rt		53.6		
803							111.7						
355		-114.5	69.7				108.1		51.2 left + 50.6 rt		56.6		
12317			68.4						+ 48.3 rt 48.9 left	61.4	55.2		
total	848.6	1145.6	698.4		488.8	1061.8	1224.0		447.8	340.7	399.7	102.3	107.6
Thaws 236	88.3	109.8	68.3	264.4	63.6	122.9	115.0	301.5	50.2 left 49.6 rt	68.9	58.5	—	—
206	89.4	108.8	67.6	272.8	63.1	119.9	115.3	298.3	— 49.3 rt 50.0 left	71.6	61.3	13.7	14.0
18456	90.1	111.9	70.5	272.5	63.7	121.9	116.3	301.9	51.6 left 50.7 rt	75.7	59.3	14.0	14.3
18478	101.7	122.1	79.8	303.6	69.5	132.5	128.0	330.0	57.0 left 55.9 rt	81.6	65.2	14.8	16.0
total	369.5	450.6	286.2	1113.3	259.9	497.2	474.6	1231.7	206.2	297.8	244.3	42.5	44.3
Nuthatches	92.2	108.6	67.9	268.7	61.0	113.3	108.4	282.7	46.9 left	71.0	57.8?	15.0	14.5
Cherivay													
min	87.8	107.7	65.2	260.7	57.0	109.1	104.2	270.3	46.3 left 45.8 rt	61.4	55.5	12.3	14.6
max	97.1	118.8	72.2	289.1	63.4	122.8	115.0	301.2	53.0 rt	73.0	60.8	13.5	15.8
mean	94.3	114.5	69.8	278.6	61.1	117.9	111.3	290.13	49.9	68.1	57.1	12.8	15.3
Thaws													
min	88.3	107.8	67.6	263.7	63.1	119.9	115.0	298.0	50.0 left 49.3 rt	68.9	58.5	13.7	14.0
max	101.7	122.1	79.8	303.6	69.5	132.5	128.0	330.0	57.0 left 55.9 rt	81.6	65.2	14.8	16.0
mean	92.35	112.6	71.55	278.3	64.97	124.3	118.65	307.9	51.2	74.4	60.7	14.1	14.7
pezail					57.8	109.9			45.0 left				
min	81.9	100.5	61.7	247.1	59.1	111.4	100.3	270.8	43.6 rt	67.3	53.8	13.0	12.8
max	94.8	112.3	72.8	279.9	67.8	122.3 (4)	115.3	305.4	51.2 left 50.0 rt	69.5?	61.1	14.8	13.6
mean	88.3 (3)	106.2	65.9 (5)	260.6	63.2 (1)	116.2 (2)	109.3 (1)	288.7	47.8 left 47.0 rt		57.3	14.1	13.3
Nuthatches	88.3 88.0 88.0												

	cranial length	cephalic index	cranial height	cephalic height	nasal index	femur length	femur platymeric index	femur robustic index	tibia platycnemic index	tibia robustic index	humerus robustic index	humerus platybrachic index
Cheriwa												
19670				83.6		100.9	41.7	74.0		54.9	51.4	88.0
32180	46.1 ✓	54.7	86.6 ✓	81.6		102.0	62.1	76.3	72.4	53.5	50.6	83.8
322338	44.8	52.5	80.6 ✓	81.0		105.2	60.6	74.8	70.2	55.4	51.6	87.0
19671	45.1	53.4	82.3	83.5		101.3	60.8	74.2	72.0	55.0	51.6	87.6
739	44.6 ✓	53.0	83.7	81.4		103.0	60.6	74.5	71.3	53.3	50.4	85.1
736	45.3	51.6	81.1	79.6		103.8	60.9	71.9	71.7	55.7	52.0	88.5
1043	———		———	83.0		101.8	—	—		55.1	51.6	—
420	———		———	81.2		—	—	—		—	—	—
738	———		———	—		—	—	—	70.3	—	—	—
355	47.1					105.0	61.0	—	72.4	—	—	—
Thamo												
236	43.6	56.7	79.0	81.9		93.7	58.0	77.4	73.4	55.2	51.7	93.2
206	43.6	55.9	79.3	82.9		94.7	57.0	75.6	74.0	54.6	52.6	83.3
18456	43.1	55.6	78.5	80.5		97.2	63.0	78.2	71.1	54.7	52.3	90.4
18478	43.7	55.0	80.5	83.3		95.4	65.4	78.7	70.1	53.3	52.4	87.2
Lutoya 19916	43.6	51.3	77.4	84.8	85.0	100.1	62.5	73.6	69.6	56.2	54.8	89.8
Quinta Ratos Cheriwa												
mins.	45.3	53.3	81.1	81.7	84.7	113.8						
maxs	46.0	54.5	83.4	82.4	84.4							
means	45.2	53.3	82.0	82.5	85.1							
Thamo												
mins	43.5	56.6	79.3	81.9	76.6							
maxs	43.6	55.2	80.5	83.3	79.5							
means	43.5	55.5	79.0	81.9	77.6							
fossil												
mins	43.4	53.3	75.3 73.0	81.5	81.6	100.1		75.4	70.4	58.8	53.0	95.6
maxs	43.3	52.7	73.7	84.3	82.1	97.4		76.8	68.6	58.9	55.4	93.3
means	43.0	53.2	74.5	83.4	81.10	97.3		74.5	71.4	57.6	54.4	95.7

Lengths in Greyhorns cherriway

Species	Tarsus	tibia	femur	leg	carpus	ulna	humerus	wing	Rectrix 2nd pair	Length coracoid
average including 1220 →	94.3									
cherriway 196708	96.1	115.0	71.2	282.6	62.6	121.8	114.0	297.4	95	—
321805	96.0	117.8	73.2	287.0	61.3	121.1	114.6	297.0	96.5	52.9
322338	93.5	115.7	70.0	279.2	60.8	116.7	109.8	287.3	97.	49.2
196718	95.6	114.7	70.9	281.2	62.2	120.3	113.1	295.6	95	51.1
73997	96.6	118.8	72.0	287.4	61.3	121.5	114.9	297.7	96.5	51.3
736	94.5	111.8	68.0	274.3	60.2	115.8	107.8	283.8	96.5	48.7
Total	572.3	693.8	425.3	1691.7	368.4	717.2	674.2	1758.8		252.2
average	95.3	115.7	70.9	281.9	61.4	119.5	112.2	293.2	96	50.6
new 1720	87.8	107.7	65.2	260.7	57.0	109.1	104.2	270.3	96	45.8
1043	97.1	117.0			63.4	122.8	115.0	301.2		
420	91.4	112.6				112.7				
738			69.8				110.8			49.3
803							111.7			
355		114.5	69.7				108.1			50.6
Total	188.5	344.1	139.5			235.5	445.6			
average	94.2	114.7	69.7		63.4	117.8	111.4			
Grand Total	760.8	1037.9	564.8		431.8	952.7	1119.8	2060.0		353.1
average of all Tharros	95.1	115.3	70.6		61.7	119.1	111.98	294.2		50.6
236	88.3	107.8	68.3	264.4	63.6	122.9	115.0	301.5	88	50.2
206	89.4	108.8	67.6	272.8	63.1	119.9	115.3	298.3	91.5	50.0
18456	90.1	111.9	70.5	272.5	63.7	121.9	116.3	301.9	90.5	50.1
18478	101.7	122.1	79.8	303.6	69.5	132.5	128.0	330.0	92.	55.9
Total	369.5	450.5	286.2	1113.3	259.9	497.2	474.6	1231.7		206.2
average	92.35	112.6	71.55	278.3	64.97	124.3	118.65	307.9	90.5	51.3
cherriway min	91.4	111.8	68.0	271.2	60.2	112.7	107.8	280.7	96.8	48.7
max	97.1	117.8	73.2	288.1	63.4	122.8	115.0	301.2	95.5	52.9
mean	95.1	115.3	70.6	281.0	61.7	119.1X	111.98	294.4	96.6	50.6
Tharros min	88.3 S	107.8 S	67.6 S	263.7	63.1 L	119.9 L	115.0 L	298.0	88.5	50.0
max	101.7	122.1	79.8	303.6	69.5	132.5	128.0	330.0	92.0	55.9
mean	92.35	112.6	71.55	276.0	64.97	124.3	118.65	307.92	90.0	51.3
fossil min.	81.9	100.5	61.7X	244.1	57.8 head 59.1	111.4X	100.3	270.8	90.5	43.4
max.	94.8X	112.3	72.8X	279.9	67.8X	122.3	115.3	307.4	92	50.0
mean	88.5X	106.2X	65.9	261.7	63.2X	116.2	109.3X	288.4	90.7	47.1
Lustrous	92.2 (88.8-95.0-91.5 mean)	108.4	69.9	268.7	61.0	113.3	108.4	282.7	95.	47.5

Ratio tarsus & humerus

Thanus 236	76.6	76.6 – 79.4
206	77.5	
18456	77.3	
18478	79.4	
Chemiz 19670	84.3	83.8 – 87.6
321805	83.8	
322338	85.3	
19671	84.5	
739	84.1	
736	87.6	
1043	84.4	

Thanus mins. 76.6
" maxs. 79.4
" average 77.7

Chemiz mins. 84.7
" maxs. 84.4
" average 85.1

fossil mins. 81.9
" max.s. 81.5
" average 81.7

Lutrus — 85.0

Ratio humerus & tibia

Thanus 236	106.6%	104.9 – 106.6
206	106.0	
18456	105.0	
18478	104.9	
19670	98.2	94.7 – 98.7
321805	97.4	
322338	95.0	
19671	98.7	
739	96.7	
736	96.9	
1043	98.3	
385	94.7	

fossil mins 99.9
maxs. 102.5
average 102.2
99.9 – 102.5

Lutrus 99.9 – 99.9

Polybonus

Coracoid	Carpus	Ratio
43.6	59.1	73.7
44.2	59.1	59.3	74.6	74.4
44.3	59.2	59.3	74.7	74.6
44.3	59.2	54.7	74.7	74.0
44.9	59.4	60.1	75.6	74.7
45.0	59.5	60.4	75.6	74.6
45.0	60.2	60.7	74.8	74.2
45.1	60.7	60.7		74.2
45.2	61.1	61.0		74.0
45.3	61.2	61.0		74.2
45.3	61.2	61.0		74.2
45.5	61.4	61.2		74.4
45.5	61.7	61.4		74.2
45.8	61.7	61.4		74.7
45.8	61.8	61.5		74.7
45.8	61.9	61.5		74.7
46.1	62.0	61.5		75.0
46.1	62.0	61.8		74.8
46.1	62.1	61.6		74.8
46.2	62.2	61.7		
46.2	62.3	61.7		
46.3	62.4	61.8		
46.4	62.5	61.9		
46.4	62.5	61.9		
46.5	62.6	61.9		
46.6	62.6	62.0		
46.8	62.6	62.0		
46.8	62.9	62.0		
46.8		62.1		
46.9		62.1		
46.9		62.2		
47.0	62.9	62.2		
47.0	62.9	62.4		
47.1	63.0	62.5	74.7	75.4
47.1	63.2	62.6		
47.2	63.2	62.6		
47.2	63.3	62.7		
47.2	63.3	62.8	74.5	75.0
47.2		63.0		
47.3		63.0		75.0
47.3	46	63.0		75.1
47.3	63.5	63.0		75.1
47.4		63.1		75.1
47.4	63.7	63.2		75.0
47.4	63.8	63.3		75.0
47.4	63.9	63.4		74.8
47.5	64.0	63.5		74.7
47.5	64.0	63.5		74.7
47.5	64.0	63.6		74.7
47.6	64.0	63.6		74.7
47.6	64.1	63.7		74.6
47.6	6	63.8		74.5
47.6	64.2	64.0		74.4

Coracoid	Carpus	Ratio
47.6	64.2	64.0		
47.6	64.3	64.1		
47.6	64.4	64.1		
45.7	64.5	64.2		
47.8	64.6	64.4		
47.8	64.7	64.5		
47.8	64.7	64.6		
47.9	65.0	64.6		
47.9	65.0	64.7		
47.9	65.4	64.7		
48.0	65.4	64.8		
48.0	65.4	64.8		
48.2	65.5	65.0		
48.5	65.6	65.0		
48.6	65.7	65.1		
48.7	65.8	65.2		
48.7	6	65.4		
48.8		65.4		
48.9	66.0	65.4	74.0	
49.0	66.2	65.5		
49.1	66.2	65.5		
49.2	66.5	65.8		
49.2	66.8	65.8	73.4	
49.3	66.8	65.8		
49.5	66.8	66.2	74.1	
50.0	67.8	66.3	73.7	
50.0		66.6		

74.5%

(74.5% (min 73.7 to max 75.5) 1.8%)

74.7
74.8
75.5
75.2

1
2
4
7
3 1 7 (2
0
1

(74.4

140
1613.
35) 261
245
163
140
30
2

35
7
245
216

48
148
50

60
50
60

61
48
13

~~Ectypoma~~

Colyborus

.973
2918.2
270 30
270
218
210
8

Humerus	Tibia	Tib/hum. Ratio
~~100.3~~ 102.0	101.1	100.5	99.4
104.0 104.3	104.2	100.7	96.6
104.6 104.8	104.7	101.0	96.6
105.2 105.6	105.4	102.2	97.0
105.9 105.9	105.9	103.7	97.9
106.1 106.6	106.3	104.3	98.1
106.8 106.9	106.9	104.3	97.7
107.2 107.2	107.2	104.5	97.5
107.6 107.8	107.7	104.7	97.4
107.8 108.0	107.9	104.8	97.2
108.6 108.8	108.7	105.0	96.6
109.0 109.0	109.0	105.3	96.8
109.1 109.1	109.0	105.5	96.8
109.1 109.2	109.1	105.8	97.0
109.6 109.8	109.7	106.4	97.2
~~109.9~~ 110.1	110.0	106.6	96.9
~~110.2~~ 110.2	110.2	106.6	96.6
110.3 110.3	110.3	106.8	96.8
(110.4) 110.5	110.5	107.0	96.9
110.6 ~~110.7~~	110.6	107.3	97.3
~~110.8~~ 110.8	110.8	107.5	97.2
~~111.1~~ 111.1	111.1	107.7	97.0
111.5 111.6	111.6	108.2	97.0
111.8 111.9	111.9	108.4	97.0
~~112.0~~ 112.0	112.1	108.5	96.8
112.1 112.2	~~112.3~~	109.5	97.7
~~112.4~~ ~~112.4~~	112.4	109.7	97.6
112.9 113.4	113.4	110.3	97.6
113.9 114.3	114.2	112.0	98.1
114.7 115.2	~~114.9~~	112.3	97.9
~~115.3~~			

30 2918.4 2

Tibia length = .973 Humerus length

median humerus = 109.9 lutosus 1.5 less

By indivs. By groups.

100.9 – 105.2	101.2 – 104.1	cheriway
93.7 – 97.2	93.7 – 97.2	Dranco
100.1 —		lutosus
	96.6 – 99.4	fossil

cheriway

Tibia	Humerus	ratio
111.8	107.8	1038
112.6	108.1	104.1
(113.5)	109.8	103.2
114.5	110.8	103.2
114.7	111.7	102.7
115.0	113.1	101.5
115.7	114.0	101.2
117.0	114.6	102.1
117.8	114.9	102.3
118.8	115.0	103.2

~~Dranco~~ ~~tibia~~ ~~humerus~~ ~~ratio~~

270.1 283.7 95:4 9D

	carb dotasium	To tibia	δ femur	δ ulna	δ humerus
chair −	65.8	53.8	88.4	53.4	55.7
+	65.3	53.8	86.7	51.6	55.1
thans −	71.5	58.5	93.3	52.6	54.8
+	68.4	56.9	87.1	52.4	54.3
frail −	72.1	58.7	93.6	52.7	58.8
+	70.7	59.3	91.3	54.4	57.7
lutrous	67.3	56.7	91.5	55.1	57.4

Ratios of one element to another – Carnivores

Recent by individuals, fossil by series, selecting Thenpoint max, min, mean, & median ratios

	Ratio of leg bone to wing	Ratio of humerus to femur	Ratio of tibia to humerus	Ratio of ulna to carpus	Ratio ulna to femur	Ratio ulna to humerus	Ratio of wing to leg	Ratio of ulna to tibia
cheriway								
19670	94.6	84.3	100.9	—				
321805	96.6	83.8	102.8	86.6	55.2			
322338	97.3	85.3	105.2	80.6	52.6			
19671	95.3	84.5	101.3	82.3	53.6			
739	96.6	84.1	103.0	83.7	53.1			
736	96.8	87.6	103.8	81.1	51.7			
1220	96.4	84.3	103.1	80.6	52.3			
94?	91 67 36			6 4 4 9	6 B 1 4 7	53.1		
thamus								
236	87.8	76.6	93.7	79.0	56.3			
206	91.4	77.5	94.7	78.2	55.2			
18456	90.3	77.3	97.2	78.5	54.7			
18478	a20 ~~91.5~~	79.4	95.4	80.5	55.1			
lutosus 19414	95.1		100.1	77.4				
fossil * max.	91.5		99.4	75.1				
min	89.7		96.6	73.7				
mean	90.4		97.3	74.4				
median	90.4		97.3	74.7				

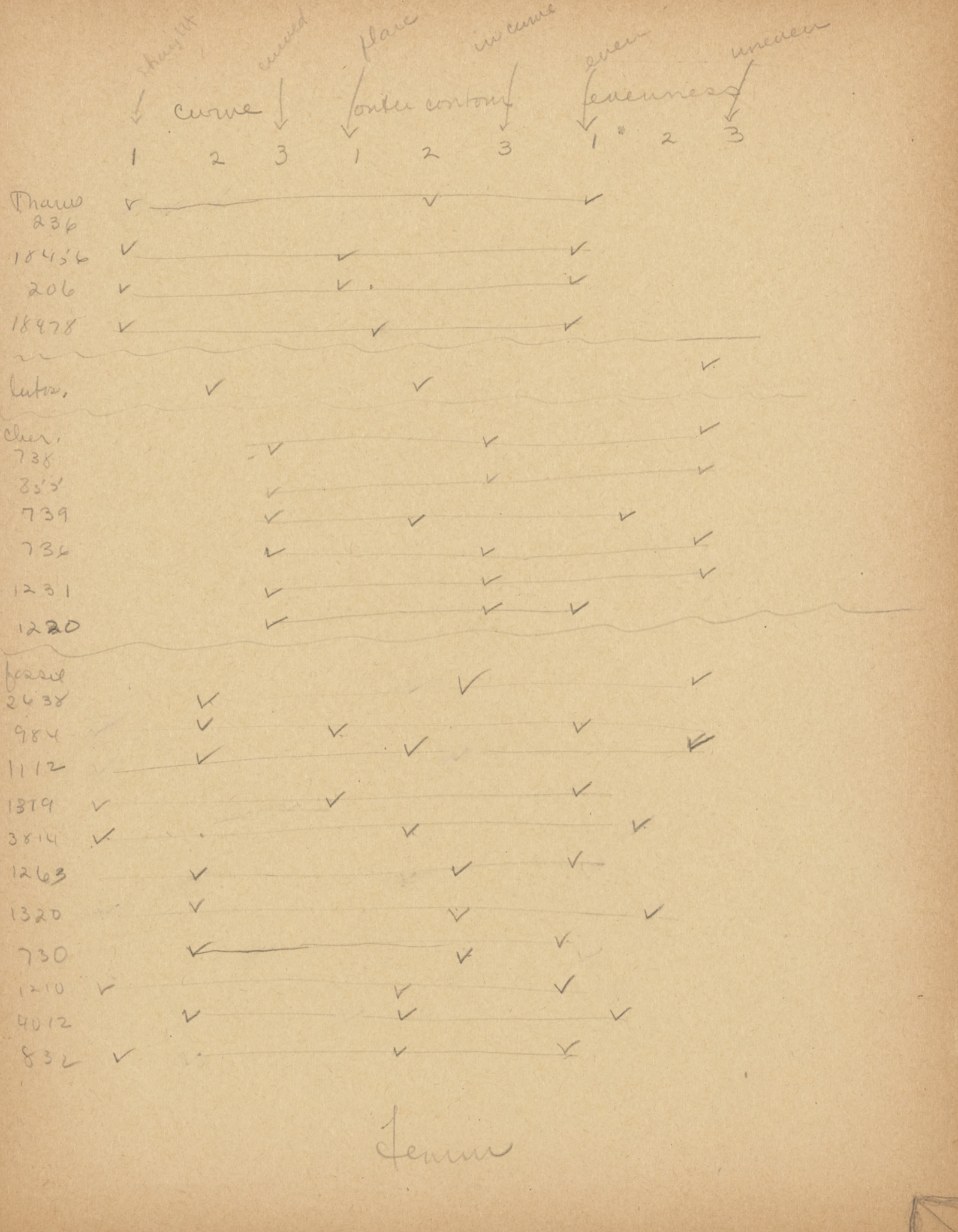
* taken by lining up series of wing & leg bones & checking across

	Length of Tarsometatarsus	Length of Tibiotarsus	Length of Femur	Length of Leg	Length of Carpometacarpus	Length of Ulna	Length of Humerus	Length of Wing	Length of Right Coracoid	Length of Beak measured from anterior most perforation to top of nares	Length of beak from bridge to center of curve of tomium	Ratio Coracoid to carpometacarpus		Ratio tarsus to humerus	Ratio tibia to humerus
Polyborus cheriway maximum	97.1	118.8	73.2	289.1	63.4	122.8	115.0	301.2	53.0	27.5	26.4	[illegible]	86.6	54.6	103.2
mean	94.3	114.5	68.8	278.6	61.1	117.9	111.3	290.2	49.6		24.6	[illegible]	82.4	53.1	
minimum	87.8	107.7	65.2	260.7	57.0	109.1	104.2	270.3	45.8	26.2	23.6	[illegible]	80.6	51.7	102.9
Polyborus tharus maximum	101.7	122.1	79.8	303.6	69.5	132.5	128.0	330.0	55.9	26.4	24.9	[illegible]	79.1	56.3	
mean	92.3	112.6	71.5	278.3	64.9	124.3	118.6	307.9	51.2		23.5	[illegible]	78.7		
minimum	88.3	107.8	67.6	263.7	63.1	119.9	115.0	298.0	49.3	24.3	22.7	[illegible]	78.2	55.1	
Polyborus lutosus U.S. Nat. Mus. no. 99916	92.2	108.6	67.9	268.7	61.0	113.3	108.4	282.7	46.9	24.1	23.5	[illegible]	77.0	50.9	100.1
Polyborus californianus n. sp. maximum	94.8	112.3	72.8	279.9	67.8	122.3	115.3	305.4	50.0	22.9	20.9	[illegible]	79.7	53.1	100.1 [illegible]
mean	88.5	106.2	65.9	260.6	63.2	116.2	109.3	288.7	47.0		20.4	[illegible]	74.4	53.0	97.2
minimum	81.9	100.5	61.7	244.1	59.1	111.4	100.3	270.8	43.6	21.6	20.1	[illegible]	73.8	52.7	97.0

Comparison of caucasia modern femora – Posterior view

	outer contour	swelling near obturator ridge	direction of obturator ridge	prom. of ridge
lutosus	straight or slightly flared at obturator	markedly present about ½ bet. ridge & trochl.	straight	def'ly demarcated ridge deep ex. int'ly
cherinay 1220	curved in	absent	oblique	indef. sl. convex ridge a little more def, smooth
739	" "	" except post.	"	" " " "
1231	" "	slightly indicated as in lut.	"	" " " "
355	" "	absent	"	still " " "
738	" "	slightly indicated post.	"	" " " " curve with slight prom.
736	slightly "	absent	"	" " " " " " " "
thanus 18456	flaring out	rounds into trochl.	straight	indef. thin protrudy smooth
206	" "	" " "	"	" + smooth
236	practically straight	" " "	"	" " "
18478	flaring out	" " "	"	a little more def, less smooth
fossil				
987	slight flat part but curved in	absent or rounded in	oblique	defly demarcated
E 1112	straight	present	"	" "
E 2638	straight ?	"	straight	lost,

236 —— 18478 —— 738
lost —— thanus —— bet. 738 + lut
" —— 355 —— " " " "
" —— 206 —— 355 (738)
" straight —— 355 —— bet " + lut
236 " —— 18478 —— 18478?
But straight —— 738 —— bet 738 + lut
739 " " —— 206 —— 739?
WF 355 —— 736 —— 736


straight
curved
plane
in curve
even
uneven
curve
outer contour
evenness
1 2 3 1 2 3 1 2 3
Thaw 236
1845/6
206
1847/8
Luter.
Cher. 738
835
739
736
1231
1220
fossil 2438
984
1112
1379
3814
1263
1320
730
1210
4012
832

Tenn

fossil
Cherimay

136 tarsus – all smaller
tibia – nearly " "
femur – half & half
carpus – all larger
ulna – a few not larger
hum – " " "
cora – mostly smaller

1220 tarsus half & half
tibia " "
femur " " (a bit on the long
carpus all longer
ulna " "
hum nearly " "
cora " " "

3238 tarsus nearly all smaller
tibia — " "
femur — " "
carpus nearly " longer
ulna half & half
hum nearly " " (a little on the short)
cora " " smaller

7390 tarsus all "
tibia " "
femur " "
carpus nearly " larger
ulna " " smaller
hum " " "
cora — " "

fossil Thanus

236 tarsus – half & half
tibia – " " "
femur " "
carpus " "
ulna all smaller
hum " "
cora practically all smaller

206 tarsus half & half
tibia " " " (a little on the short
femur " " "
carpus " "
ulna – nearly all smaller
hum — " "
coracoid " " "

1845 tarsus half & half
tibia nearly all shorter
femur " "
carpus half & half
ulna nearly all shorter
hum — " "
cora " "

Cherimay

1967 tarsus all shorter
tibia " "
femur " "
carpus half & half
ulna nearly all shorter
hum " " "
cora all shorter

fossil to Chehalis

736 ✓ smaller body size
relatively longer wings ⊤
shorter legs

1220 ∧ body size nearly same
but longer wings

322338 · body size smaller
legs shorter
wings about same so =
rel. longer espec. carpus

739 · body smaller
legs rel. smaller than
wings
carpus rel. larger

19671 · body smaller
legs rel. shorter than
wings,
carpus rel. longer

fossil to Chehalis

236 fossil with smaller
body size ⊤ wings but
legs relatively longer
carpus rel. "

206 ✓ smaller body ⊤ wings
legs about same = rel. longer
carpus rel. longer

18456 ∧ body smaller ⊤ wings also
legs rel. longer
carpus rel. longer

Humerus

236
Thanes

Muscle scar at ant. end
a roughened surface above
The ~~Medium~~ crest
a ridge below

115.0 length
23.3 prox. - 20.2% 29.8 ac. bicip. 10 + th. below bicip
18.7 dist. - 16.2%
depth 11.4 dist

no depression here

153 distance to 65.6% (to prox)
end of infraspinatus attachment
15.8 depth prox. end from
internal tub. to bicipital tuberosity

Head forms angle prox'ly with
delfoid crest

Bicipital outline very convex
showing distinct junction with shaft

Head (prox) (contour) low, broadly convex

9.5 mm.

delfoid crest

lig. attach. at ext. tub.
Broad and a bit indefinite

739
Cheriway

Muscle scar at ant. end
a large protuberance
above the ~~Medium~~ crest
? small knob below

237 114.7 length
111 22.3 prox. - 19.4%
18.6 dist. - 16.2%
depth 11.1 dist

slight depression
under pneumatic fossa
at base of med. crest

62.8% 14.0 for this distance
14.8 depth (same as 236)

Head ~~rounds~~ into
deltoid crest prox'ly

Bicipital surface
merging gradually into
shaft

Head (prox.) high, narrowly
convex

2.3 mm.

into little bulge

lig. attach. narrow &
fairly well defined (oval)

236
Thanus

739
Chenway

Attachment of ant. art. lig. set at this angle ___ to dist. end	✓	at this angle ___
impression of brachialis anticus broad + ~~very~~ fairly shallow except for cut at edge at dist. point	✓	imp. of brach. ant. narrow + fairly deep with larger area of deep part at dist. pt.
ext. condyle smoothly curved (palmar side)	✓	ext. condyle with little twist at its prox. pt.
ext. side above condyle smooth (ext. view)	✓	ext. side above condyle (ext view) little depression
Facet at tip of ectepicondylar proc. depressed	X	not depressed
Palmar area of distal end less depressed	✓	more depressed
Line ~~running dist'ly down shaft from deltoid crest~~ set in from ext edge of shaft ~~deltoid crest~~ "tocing in" length ~~5/32"~~ ca. 10.7 mm. longer	?	~~Line not extending~~ placed + shorter ~~1/11~~ (7.5 mm shorter
Ulnar side dist. end ext. groove narrow + deep	X	ext groove broader + shallower
Ectepicondyle prominent	?	Ectepicondyle less prominent

Stoutness & slenderness

Coracoid

Depth/head 2.1 – 2.5 3.2 – 4.1 dver. ext – & plaeus

2.0 ——— 3.3 fossil

2.4 ~~R~~ C

Ulna

prox breadth 11.9 – 12.9 12.8 – 13.7 both

12.3 ——— 13.4 13.6 p

dist. breadth 6.5 6.8 6.5 – 7.4 both dist

6.4 ——— 7.2

6.8 p

shaft breadth 4.2 – 4.4 4.6 – 5.1 both max's

4.4 ——— ~~5.0~~ p 5.1

Humerus

prox. breadth 19.1 – 20.4 19.7 – 21.0 both

19.2 ——— 20.5 p 20.6

dist br. 15.5 – 16.7 16.1 – 17.3 both dist ext

16.3 ——— 17.0 p 17.4

Carpus

Depth prox ~~15.0 – 16.2~~ 16.0 – 17.4 ~~both ? ulna ext~~

14.6 – 15.6 17.0

br. trochlea 5.7 – 6.1 6.4 – 7.2 both

5.5 ——— 6.6

37.8 – 40.6 39.0 41.4

35.6 ——— 42.7 both beyond extr.

41.3 p

Taurus

Prox Gr. 13.7 – 14.9 14.8 – 15.9 Both exts + beyond

13.1 — 14.9 both — 16.1

dist Gr 15.1 – 16.7 16.4 – 17.8 both ext. equestrian

14.4 — 15.8 C — 17.4

sh. Gr, 5.6 – 6.2 5.6 – 7.x both ext + below mins.

5.3 — 6.1 both — 7.1

Med. trach. 5.2 – 5.6 5.9 – 6.x both + below chev. min.

4.9 — 5.6 C — 6.0

Reak

Gr. 45.0 – 49.5 55.7 – 57.9 61.6 formerly above all

58.1 – 67.x

Femur

prox br. 22.9 – 24.2 24.8 – 26.6

23.0 — 25.0p — 27.1

Both pairs max/plat.

dist br. 21.2 – 22.4 21.6 – 23.6

20.0 — 23.2p — 23.6

both extremes

sh. br. 10.0 – 11.2 10.4 – 11.3

10.0 — 11.3p — 12.5

both extremes + beyond max

Tibia

prox br. 10.8 – 11.8 11.8 – 12.8

11.1 — 12.3 12.5p

both – no extr.

dist br. 11.2 – 12.1 12.2 – 12.7

11.5 — 12.6 12.6p

both no extremes

sh br. 46.3 – 47.7 — 50.0 – 52.2

48.1 — 53.5

48.2

neither but = proxil planum + lower

Pelvis

br. optics 54.4 – 66.7 61.9 – 71.4

66.8 — 75.0

66.3

out

bi. renal breadth 83.2 – 95.5 89.1 – 100.2

90.8 — 104.8

renal

86.9c

clen.

Bone appears curved emphasized by general curving of ext. contour & apex of post. surf. ↑

planus

appears straight emphasized by tendency ♂ outward flaring ext. contour ↑ straighter apex ♂ post side of shaft

Balancing inward slant of ant. contour

pelutonus

Generally straight with ext. contour slightly flared ↑ apex ♂ ant. ext. Range includes greater curvature, however

lutonus

appears straight ext. contour

is straight also except for pointed distal edge of beak.

734 15.6

731 15.2

1045L 17.5

736 16.2

206 17.3

231.3

23.0

23.4

21.6

22.4 21.7

21.2 21.2

21.4

nigrith - chenirig

ext. surf ♂ post. end included in nigrith

obturator ridge usually well indicated but not sharp

planus

ext. surface (part bare) smooth. Obturator ridge generally less marked than chenirig area more rounded

pelutonus

Tendency ♂ slight nigrith of ext surf abortad in chenirig

obturator ridge generally dev'd abortas in chenirig or a little more sharply

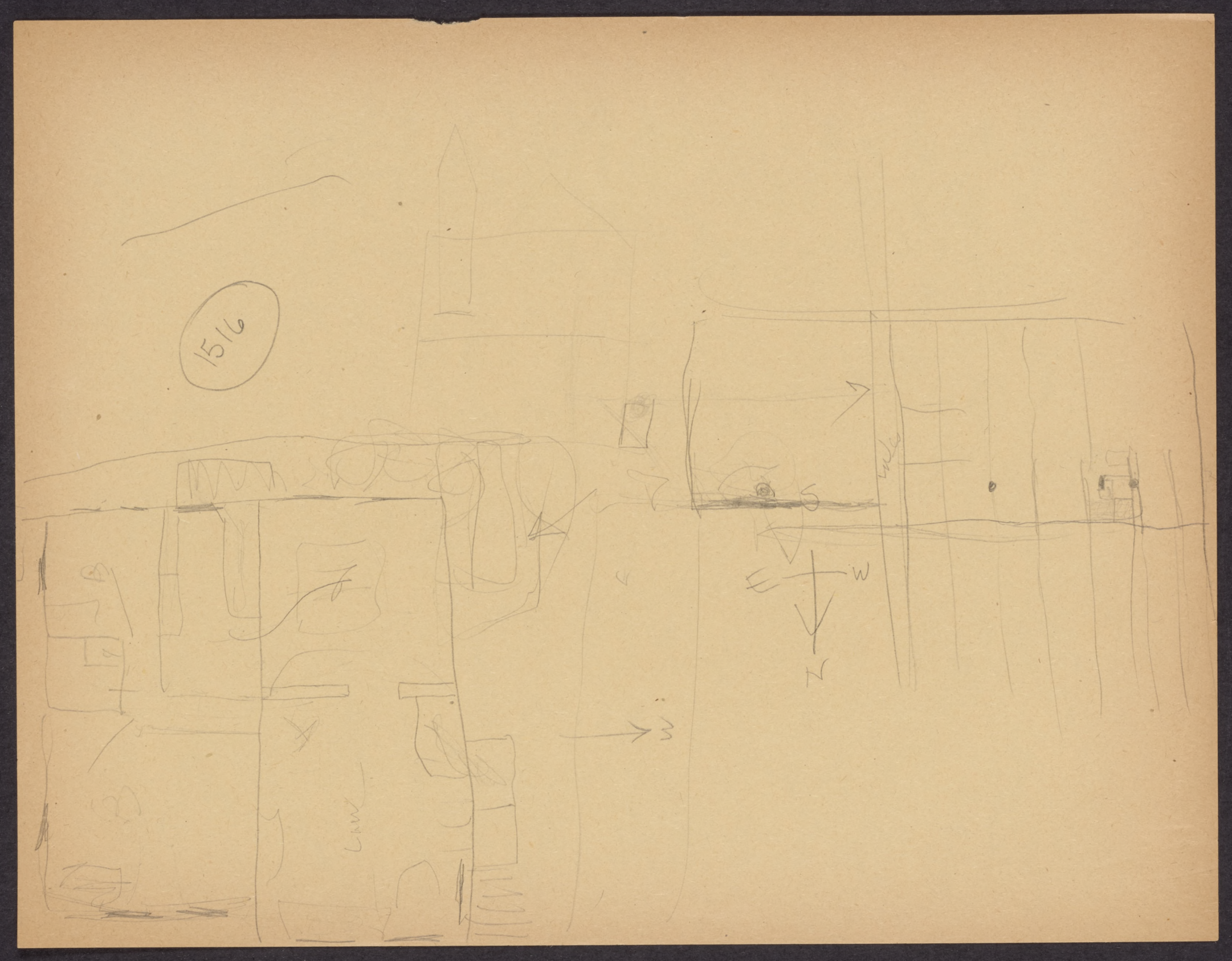
Range includes both smoother & more nigrith specimens

lutonus

ext surf decidedly nigrith

obturator ridge very prominent

↑ sharp


1516
E
W
N

McKittrick Canada from Cal Tech

Humerus	Carpus	Femur	Tarsus
107.1	62.2	64.9	90.2
	61.8	67.5	89.4
Tibia	62.2	65.2	85.6
103.2	Coracoid	65.0	92.5
Ulna	48.2	64.4	
117.0			

Measurements of Beak

	Length measured from anteriormost perforation to top of naris	Height measured just anterior to roughened ridge on bridge between nares to ramus	Breadth measured at same point on ramus as the preceding	Distance from lower edge of ramus to	Ratio ba	Ratio ca	Ratio cb	Ratio dc
Polyborus californianus Type								
L.A.M. no. E 4485	22.1 mm.	13.3 mm.	14.8 mm.	8.7 mm.	60.3 %	67.0 %	111.0 %	59.7
~~L.A.M. no. F 3159~~	~~21.6~~	~~13.3~~	~~14.6~~	~~8.0~~				
~~L.A.M. no. E 4505~~	~~13.0~~	~~12.8~~	~~13.0~~	~~7.6~~				
Polyborus californianus maximum meas.	22.9	13.6	14.8	8.8	62.4	67.6	111.0%	60.3
P. californianus minimum meas.	21.6	14.5	13.0	7.6	58.3	59.2	101.5%	58.5
Polyborus lutosus								
U.S. Nat. Mus. no 18916	24.1	14.5	15.0 *	9.3 **	60.3	62.3	103.4%	62.0 **
~~Polyborus cheriway max. meas.~~								
Polyborus tharus max. meas.	26.5	16.0	14.8	10.5	60.4	57.5	98.0	75.0
min. meas.	24.3	14.3	13.7	10.0	57.6	56.0	92.5	69.0
Polyborus cheriway max. meas.	27.5	15.9	13.5	11.1	59.6	49.1	89.1	87.4
min. meas.	26.2	14.3	12.6	10.6	53.7	44.5	79.3	81.5

* Measurements ~~of breadth~~ on skins in Mus. of Nat. Hist., San Diego show minimum breadth of 14.3 mm.

** " " " " " " " " " " " max. distance of 10.1 mm.

with ratio to breadth of 70.3 %

Measurements of Tarsometatarsus

	Polyborus californianus[1]			Polyborus lutosus[2]			Polyborus tharus			Polyborus cheriway		
	maximum	mean	minimum	maximum	mean	minimum	maximum	mean	minimum	maximum	mean	minimum
Length	94.8	88.5	81.5	95.0 ♀	90.4 (U.S. Nat. Mus. no. 19916 = 92.2 mm.)	84.0 ♂	101.7	92.3	88.3	97.1	94.3	87.8
Breadth proximal end												
relative to length	16.1	14.7	13.4		14.9		15.9	15.3	14.8	14.9	14.1	13.7
Breadth distal end												
relative to length	17.4	16.2	15.1		15.8		17.8	17.0	16.4	16.7	15.6	15.1
Breadth shaft												
relative to length	7.1	6.1	5.4		6.1		7.4	6.5	6.0	6.2	5.8	5.6
Breadth middle trochlea												
relative to length	6.0	5.7	5.4		5.6		6.4	6.0	5.9	5.6	5.4	5.2
No. of specimens	See [1] below			See [2] below			four specimens			Nine specimens		

[1] Measurements of length of fossil, based upon 265 specimens; ratios on 35.

[2] " " " " lutosus " " records from Ridgway (and W. E. Bryant (Calif. Acad. Sciss. Publ. vol 2, 1887, p 283) and skins in collection of San Diego Museum of Natural History, as well as skeleton U.S. Nat. Mus. no. 19916 (Guinall); ratios on skeleton only.

Measurements of tarsometatarsus

	Length			Breadth prox. end relative to length			Breadth distal end relative to length			Breadth of shaft relative to length			Breadth of middle trochlea relative to length			no. of specimens
	max	mean	min.	max	mean	min.	max.	mean	min.	max	mean	min.	max.	min.	mean.	
Polyborus californianus	97.8	88.5	81.9	16.1	14.~~8~~7	13.4	17.4	16.~~2~~	15.1	7.1	6.1	5.4	6.~~0~~	5.7	5.4 ~~6.0~~	26 ♂ length & 21 ratios ~~20~~
Polyborus lutosus*	95.0 ♂	1991⁶=92.2 ~~90.7~~	~~84.0~~		14.9			15.8			6.1		~~5.6~~	5.6		16 length & ratios ~~1~~
Polyborus Thamus	101.7	92.3	88.3	15.9	15.3	14.8	17.8	17.0	16.4	7.4	6.5	6.0	6.4	6.0	5.9	4
Polyborus cheriway	97.1	94.3	87.8	14.9	14.1	13.7	16.7	15.6	15.1	6.2	5.8	5.6	5.6	5.~~4~~	5.2	9

* Length measurements based on ~~ma~~lists from Ridgway (and Bryant, W. E. (Calif. Acad. Sci. Publ. 1887, p. 283), ~~and~~ skins in colls. at San Diego Mus. of Natural History, and one skeleton, no. 95/Nat. Mus. 1916, 16 indl. Ratios taken on the one skeleton ~~ma~~ only.

Measurements of Humerus

	P. calif.			P. lutosus			P. Thamus			P. cheimay		
	max	mean	min	max	mean	min	max	mean	min	max	mean	min
Length	115.3	109.3	100.3		108.4		128.0	118.6	112.0	115.0	111.3	104.2
Breadth prox end relative to length	20.6	20.0	19.2		20.5		21.0	20.5	19.7	20.4	19.8	19.1
Breadth of distal end relative to length	17.4	16.8	16.3		17.0		17.3	16.6	16.1	16.7	16.0	15.5

Hummus - Carasera

Chestway				
803	111.7		E327	115.7
738	110.6		4318	112.4
736	107.9		1318	114.6
1220	104.2		1441	110.2
			827	112.0
			3526	112.4
			3727	110.7
			7832	114.3
			4795	109.0
			5796	105.9
			588	109.0
			9994	109.2
			9561	112.1
			9842	110.4
			2552	104.0
			9354	112.1
			2547	109.0

Putorius

	length	prox. diam.	dist. diam.	sh.
tarsus	92.2	13.8	14.7	5;4
tibia	108.6	13.3	13.9	
femur	67.9	16.7	16.2	
	268.7			

		inter.	exter.
carpus	61.0	15.5	13.7
ulna	113.3	12.5	10.0
humerus	108.4	22.0	18.4
	282.7		

ratio key & wing 95%

Other specimens

Tarsus

skins in S.D. Mus.

2632	92.7 (5)
2633	90.3 (2)
2634	91.5 (3)
extremes given in Bridgman	88.8 (1)
	95.0 (6)
specimen from U.S. Nat. Mus. (slightly above average for spec. considered) (probably ♀?)	92.2 (4)

6) 550.5 (91.7 mm.

median 91.8 mm.

Blytomus coracoid -

	length of supinator tip	ratio to humerus	ratio to tarsus	ratio to carpus
luteolus	47.3	43.6	51.3	77.4
tharus				
18478	53.9	43.7	55.0	80.5
18456	50.1	43.1	55.6	28.5
206	50.0	43.6	55.9	79.3
236	50.2	43.6	56.7	79.0
cherriug				
736 ♂	48.7	45.3	51.6	81.1
739 ♀	51.3	44.6	53.0	83.7
3?? ?	50.6	47.7	—	—
738 ♀	49.3	44.5	—	—
1967/8 ♂	51.1	45.1	53.4	82.3
321805 ♀	52.9	46.1	54.7	86.6
32233 ♀	49.2	44.8	52.5	80.6

Taking all caracaras together - both chimango & thamnophilus for averages & ratios - to check with fossil & show what is expected by both spp. were present.

	-lama	orbi	femur	tib	carp.	ulna	hum.	wing	ratio
min	88.3	107.8	67.6	263.7	60.2	112.7	107.8	280.7	93.8
max	101.7	122.1	79.8	303.6	69.5	132.5	128.0	330.0	94.8
mean	94.2	114.5	70.9	279.6	62.8	119.9	113.9	296.6	94.0

294.2 95.4

281.0

average chimango (all added together)

760.8
369.5
12)1130.3(94.2
108
50
48
23

1037.9
450.5
13)1488.4(114.5
13
18
13
58
52
64

564.8
286.2
12)851.0(70.9
84
10

497.2
942.7
12)1439.9(119.9
12
23
12
119
108
11

923
95.1
187.4
93.7

1119.8
427.6
14)1547.4(110.5
14
14
14
54
42
124

431.8
259.9
11)691.7(62.8
66
31
22
97

942.7
497.2
12)1439.9(119.9
12
23
12
119
108
11

1153
112.6
227.9
112.9

119.8
124.3
243.8
121.4

10
10
10
10
30
10

15
6)90

20
20
20
3160
20
6)30
10
20
30

96
4
370

95
8
760
370
10

96
95
12)191

360
360
0

96
8
8)720(90
72
0

90
4
360

12)1120(93.3
108
40
36
40

95
90
5
2)18
9.2

94.2
95.3
2)189.5
94.7

92.3
95.1
2)187.4
93.7

Cacaoid

Chemins

736 48,7
19671 50.7
739 51.5
3555 50.6
738 47.5
322338 49.8
321805 52.3

7|35311
5044

Thaums

206 49.6
236 49.5
18456 51.0
18478 55.9

4|206.0
51.5

fossil

Boyer
T-10

3.4 – 14.5
3,4 – 15.8

Campus

3.8 – 17.9
3,8 – 15.5

P. chinensis

1399	96.6
1368	94.4
420	91.4
1043	96.8

4) 379.2 94.8
36
19
16
32

P. Thanus

206	89.4
236	88.3
1847.8	101.7
1845.6	90.1

4) 369.5
92.35

Lutosus

shins
90.3
91.5
92.7
Skel. 92.2

4) 366.7
91.7

Styrax
81.9

fossil
81.9 – 94.1
M = 89.0
(Thanus?)

ratio Tibia

chen – 80.3
Thanus – 73.0
Styrax – 78.7
fossil – 76.6 80

ratio Tshum –

chen – 85.90
Thanus – 77.1
Styrax – 81.6
fossil – 81.7
lutosus – 85.

84.1
94.1
4) 360
88.0

3.2 – 3.7 — 14.6 – 16.5

Femur

3.7 – 4.7 — 16 – 17.7

P. chinensis

108.9
108.3
114.6
110.8
111.7
108.0

6) 670.3 (111.7
6
7
6
10
6
4 3

lutosus 108.4

Styrax 100.4

P. Thanus

165.3
115.0
128.0
116.3

4) 474.6 (118.65

fossil M 108.9
115.2 – 100.3
either (chen?)

ulna

chenensis

121.5
115.7
112.5
122.7
118.6

5) 591.0 (118.2

Styrax 104.0

lutosus 113.3

Thanus

119.9
122.9
132.5
121.9

4) 497.2 (124.3

fossil

111.4 – 122.1
M = 116.5
either chen?

	chenensis	Thanus	Styrax	fossil
campus	63.6 – 60.0; 61.6	63.1 – 69.5; 64.97	55.0	66.4 – 59.1; 63.0
ulna	122.7 – 112.5; 118.2	119.9 – 102.5; 124.30	104.0	122.1 – 111.4; 116.5
humerus	115.0 – 108.0; 111.7	115.0 – 128.0; 118.65	100.4	115.2 – 100.3; 108.9
	301.3 280.5; 291.5	298.0 – 330.0; 307.92	259.4	303.9 – 270.8; 288.4

14.6
16.5
2) 31.1
15.5
2170
3140
310
300

14.2
16.
17
2) 33.7
16.8) 4.20
336
840
840
25

Tibia

P. cheriway		P. Thamus		lutrus	Dryctes	fossil
739	118.9	206	108.8	108.6	97.0	112.3 – 100.5'
736	111.8	236	107.8			M = 106.5'
1043	116.8	18478	122.1			Thamus
355'	114.1	18456	111.9			
	4)461.7		4)450.5'			
	112.9		112.6			

Femur

cheriway		Thamus		lutrus	Dryctes	fossil
739	72.0	206	67.6	67.9	65.7	63.1 – 73.0
736	69.4	236	68.3			M = 66.2
		18478	79.8			
355'	69.8	18456	70.5'			
738	69.9		4)286.2			
	4)281.1		71.55			
	70.2					

Caprus

cheriway		Thamus		lutrus	Dryctes	fossil
739	61.2	206	63.1	61.0	55.0	66.6 – 59.1
736	60.0	236	63.6			M 63.0
1043	63.6		69.5'			
	3)184.8		63.7			
	61.6		4)259.9 [64.97			
		51.7 – 52.6; 52.1		53.7	52.7	54.4 – 53.1; 55.1
		55.1 – 54.7; 54.8		56.2	54.7	57.7 – 58.7; 57.8

ratio tibia/femur 52.0 – 53.2; 52.0
" " humerus 55.5 – 55.5; 55.1

Leg. cheriway		Thamus		Dryctes	fossil
Tarsus	96.8 – 91.4; 94.8	88.3 – 101.7;	92.35'	81.9	94.1 – 81.9; 89.0
Tibia	118.9 – 111.8; 112.9	107.8 – 122.1;	112.6	97.0	112.3 – 100.5; 106.5'
Femur	72.0 – 69.4; 70.2	67.6 – 79.8;	71.55	65.7	73.0 – 63.1; 66.2
	287.7 – 273.6; 277.9	263.7 – 303.6;	276.50	254.6	279.4 – 246.5; 261.7
ratio tarsus/femur	95.6 – 95.7; 95.2	88.3 – 88.3;	88.6	98.1%	92.0 – 90.7; 90.6

Polybrus chemisay 736 (Miller) 87

	a length	b trans	c dist sh	d	e trans	f dist sh	g	ca	fc	
humer	94.4	13.4	14.5	5.1	17.9	9.8	4.3			
tibia	111.8	12.5	13.0	6.3	14.7	9.8	5.1	11.6 ba	75.4 eb	ea
femur	69.4	14.7	15.1	7.4	11.5	13.4	7.1	21.2	18.4	16.6
	275.6									

		ext max	int max			bi	xa
carpus	60.0	13.4	15.6	22.3	26.1	86.	59
ulna	115.)	br prox 12.2	depstyle 10.7	def dist 9.1	br dist 10.0	br sh 5.0	def sh 6.2
humer	108.3	21.8	7.0	9.8	17.5	8.0	7.0
	284.0						

	a length	b br.	c ht max		ba	ca	
cora.	48.2	9.9	14.9		20.6	30.4	natural ply 97%
sternum	70.3	br 38.4	depth mid 69.1	wt head 20.0			
pelvis	61.2	post br 39.0	ant br 22.3				
cran.	ht 27.9	38.4	21.4	72.7%			

	cranium c ht	a	b br	ab		cranium a	b	ab	c	ca	cb
206	19.6	28.3	37.9	74.5%	E4217	28.7	38.2	75.2%	18.8	65.5	49.3
236	22.8	29.8	39.1	76.2%	E4182	28.3	38.2	74.2	17.5	62.0	45.8
736	21.3	28.4	40.1	70.8%	E4263	27.1	38.7	70.1%	20.0	73.8	51.3
739	21.6	28.6	41.1	69.7%	1105	28.2	38.5	73.3%			
					E3731	28.9	38.2	75.6%			
	ca	cb			E1813	27.0	36.4	74.3%	17.7	65.5	45.7
206	69	51.5			E2560	28.4	38.6	73.6%			
236	76.5	56.4									
736	75.1	53.2									
739	75.7	52.6									

	cranial index length br	
739	28 38	73.7%
206	28 38	73.7
236	29.8 39.1	76.2
736	28.4 40.1	70.8
420	27.2 38.4	70.8

	beak orb. naris length br	
La Brea	5.7 2.6	45.6%
	6.4 3.0	46.4
	5.4 2.5	46.2
	5.7 2.7	47.4
	5.6 2.8	50.0

Polytomus Draws 206 (Miller)

	length a	prox br b	dist br c	d/c	prox. depth e	dist depth f	g	ba	ca	eb	fc
Tarsus	89.4	13.5	14.6	5.2	7.7	9.8	4.3	15.1	16.3	57.1	67.1
fibia	108.8	—	13.4	6.8	16.1	10.1	5.3				
humm	67.6	15.9	16.1	7.6	12.9	14.0	7.3	23.5	81.2	19.0	
leg	265.8										

	a	ext prox	int prox	ba 22.0	ca 23.3	bc 87	Gr dist x	xa 10.4
carpus	63.1	13.9	16.0				6.6	
		Gr. prox	dist prox	depth dist	Gr. dist	Gr. sh	dep sh.	ba
ulna	123.9	13.7	11.4	10.0	10.6	5.8	6.6	11.1
	a	c	c	d	e			ba ea
humm	115.3	24.1	7.6	10.9	20.0	8.5	7.2	20.8% 17.3
	301.3							

	length a	prox Gr. b	Dist prox		ba	ca	bc
cora.	49.3	10.3	16.5		20.9	33.6	
		bc	long axis	wt axis			
sternum	71.0	44.2	70.3	49.6?			
		post Gr.	ant Gr.				
pelvis	64.2	40.5	19.6				
	wt						
cran.	28.3	39.5	19.0	71.6%			

ratios Eimp
88.0 90

234 86.3 – 84.3 – 97.7%
206 87.2 – 85.2 – 97.7%
420 90.5 – 87.9 – 97.3%
736 92.6 – 90.5 – 97.7%

(W?) 14.0 – 16.1 21.6 – 24.9 87
63.6 – 13.2 15.7 20.4 – 24.1 86.4

814.9
s84.9

59
56
60

Polyborus Thamus Bi 236

	length	breadth prox	breadth dist	breadth shaft	depth prox	depth dist	depth shaft			
Tarsus	88.3	13.8	15.5	5.9	7.9	10.0	4.8			
tibia	107.8	13.6	13.6	7.0	12.0	10.4	5.9	12.6 ba	76.6 ebr	ea
femur	68.3	15.2	15.5	7.6	12.8	14.7	7.4	22.2	84.3	18.7

leg 264.4

	length	depth ext. prox	depth int. prox	Dea	ca		Brx	Kea		
carpus	63.6	14.4	16.4	22.4	28.8	87.8	6.7	10.5		
		breadth prox	depth prox	depth dist	breadth dist	breadth shaft	depth shaft	ba		
ulna	119.9	13.0	11.7	10.2	11.1	5.8	6.6	10.8		
								ba	ea	
hum.	115.0	23.3	7.7	11.4	18.5	8.0	7.3	20.2	16.1	

wing 298.5

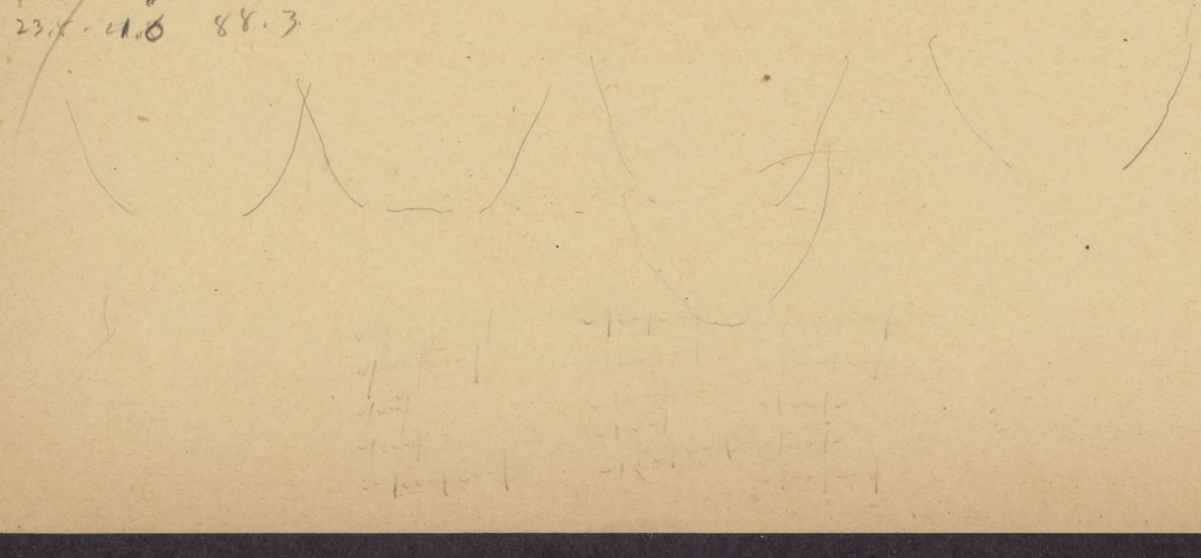
	length	breadth prox	ht. apteriorly		ba	ca
coracoid	49.4	11.1	16.1		22.2	32.6
	length	br.	length keel	ht. keel		
sternum	68.4	43.6	67.6	18.2		
		ant br.	ant br.			
pelvis	63.3-64.1	42.8	22.3			
	ant br.	ht	ant br.			
carpus	40.9	30.0	22.1			

73.7%

beak bird seen

natural size 88.5

	Pelvis length	ant/post br.	
206	26.0	~~20.2~~	~77.7
236	24.1	22.2	92.2
736	29.2	~~22.2~~	76.0
739	25.8	20.6	80.0
738	23.8	21.0	88.3



Polyborus decimus

Bi 420		pr.			dep.						
		prox	dist	sh	prox	dist	sh				
femur	91.4	13.0	14.2	5.0	7.6	9.9	4.6				
		b	c	d	e	f	g	ca	ca	ca	fe
ulna	112.5	11.7	10.1	4.9	10.3	8.6	5.6	10.4	7.6	9.0	85.2

Bi 043											
femur	96.8	13.7	15.0	5.7	8.1	10.0	5.1				
tibia	116.8	12.8	13.7	6.4	16.3	10.4	5.7	11.7%	77.7%		
	length	ext prox	int prox.								
carpus	63.6	14.3	16.2								
	a	b prox	b depr prox	d depth dist	c br dist	b br sh	g depth	ba	da	ca	de
ulna	122.7	12.4	11.0	9.2	10.6	5.6	6.3	10.1	7.5	8.6	86.7
hum	114.6	22.5	7.0	10.5	8.3	7.9	6.6				
	300.9										

Bi 738	length a	br prox b	dep prox c	br dist d	dep dist e	br shaft f	depth shaft g	ba	cb	ca
femur	69.9	14.6	11.6	15.7	13.2	7.1	7.0	20.7	19.5	16.6
humerus	110.8	21.9	6.9	7.5	10.7	7.4	6.4			
				dep	br			ba	da	ea	de
ulna	118.6	11.9	10.7	9.6	9.5	5.2	6.2	10.1	7.4	8.0	95.7
		Gr prox	ht. prox		ba	ca					
coracoid	49.0	10.0	15.0		20.4	30.6					
			prox heel	ht heel							
sternum	70.3	39.2	69.3	15.1							
		ant. br	ant. br								
pelvis	63.1	37.8	21.1								

Bi 803	length	Gr prox	dep prox	br shaft	dep shaft	Gr dist	dep sh
hum	111.7	21.4	6.9	8.1	10.3	7.3	6.7

355	length	Gr prox	br dist	dep shaft	dep prox	Gr sh	dep sh	ca	
tibia	114.1	13.0	13.8	10.4	—	6.7	5.4	12.0	5.8
hum	108.0	21.7	17.3	10.0	6.7	7.8	6.8		
		Gr prox	ht. prox		ba	ca			
cora	50.0	10.0	14.7		20.0	29.4			
fem.	68.9	38.8	64.9	18.7					
		ant br	ant br						
pelvis	61.8	37.6	21.3						
355'	length a	prox br b	prox dep c	ba	cb	ca			
femur	69.8	14.7	11.4			16.3			

Polyborus Marius - U.S. Nat. Mus. no. 18428

	a length	b breadth prox	b breadth dist	d	depth prox	depth dist		aa	ca	ab	fe
								14.8	16.2	57.5	70.0
Tarsus	101.7	15.1	16.3	6.0	8.7	11.4	5.3				
									ca	da	
tibia	122.1	14.5	17.8	7.5	17.9	11.6	6.3		12.1	6.1	
femur	79.8	18.8	17.8	8.2	13.4	15.0	8.0				
leg	303.6										

		ext prox	int prox	ba	ca	br condyle					
carpus	69.5	15.0	17.2			7.4					
	a	br prox b	depth prox c	dep dist d	br dist e	br shaft b	depth shaft g	ba	da	ea	de
ulna	132.5	13.9	12.3	10.5	11.9	6.4	7.2	10.5	7.9	9.0	88.4
hum.	128.0	24.7	7.6	12.0	20.6	8.4	7.7				
wing	330.0										

	length a	br prox	ht prox		ca
					32.1
cora	56.2	11.4	18.0		
		br	keel length	keel ht	
sternum	80.3	48.5	77.0		
		post br	ant br		
pelvis	72.4	51.7	24.1		
	prox br	ht	ant br		
cran	42.4	30.3	21.8		

P. thamin USNatMus. 18456 x = br. condyle

	length a	width prox b	width dist c		depth prox d	depth dist e					
femur	90.1	14.4	15.7	6.5	8.8	10.9	5.8	16.0	17.4	61.1	69.5
tibia	111.9	14.3	14.1	7.3	14.3	11.3	6.0		ca 12.6	da 6.4	
femur	70.8	16.3	17.3	8.2	12.9	14.6	7.8				

leg 272.5

		ext width prox	int width prox	bicon	ca	bc	x	xa
carpus	63.7	13.6	16.1				6.8	

		gr prox	dist prox	dist dist	br dist	gr sh	dep sh	ena
ulna	121.9	13.9	12.3	10.5	11.6	6.4	7.3	11.4

		a						
Humerus	116.3	24.1	7.1	11.6	19.8	8.5	7.6	

wing 301.9

	length a	br prox b	wr prox	ba	ca
Cora.	50.5	10.9	16.9		33.5

		br.	length Keel	dist Keel
sternum	75.7	41.2	71.8	20.8

	length between with sacrum	post br	ant br,
pelvis	66.9	42.3	22.5

	length br	ht	ant br,
cran.	39.9	29.9	22.4

6.7/610 6.7/610 45.7/660 1.0. 637 1.300

a b c br. Phlyctonus durnoway 7395

Bi. 739	length	prox	dist	shaft	prox	dist	sh			
tarsus	96.6	13.3	14.4	5.4	7.82	9.9	4.8			
tibia	118.9	13.0	13.4	6.6	16.4	10.6	6.0	ca 11.3	79.3	ca 5.5
femur	72.0	15.2	15.9	7.5	12.3	13.1	7.6	ba 21.1	eb 81.0	ea 17.0
leg	289.5									

		~~prox~~	~~dist~~		ca			xa	
carpus	61.2	prox 13.1	prox 15.4	ca 21.4	24.2	8.5	6.2	10.1	
		br. prox	depth prox	depth dist	br. dist	Br	depth shaft		
ulna	121.5	12.3	10.9	9.2	10.3	5.1	6.5		
humerus	114.9	22.5	7.0	10.5	17.9	8.0	7.0	ba 19.5	ea 16.0
wing	297.6								

	length	br prox	ht upper part		ba	ea
coracoid	51.0	10.5	15.6		20.6	30.4
	length	br.	length keel	ht keel		
sternum	72.9	39.9	73.4	22.2		
		post br.	ant br.			
pelvis	65.8	40.8	20.8			
	post br	ht	ant br			
cranium	40.0	28.5	21.6	71.3		

ratio cg & wing 96.6

beak

	depth	br.	
235	15.1	14.6	96.7%
206	15.6	14.6	97.4
739	16.2	14.5	89.6
736	15.7	13.7	87.4
Y20	16.5	14.0	84.9

13.9 - 15.2 - 109%

13.6 13.4 98.7%

Thylacinus megalotis 264 (Muller)

	length	breadth			depth		
		prox	dist	sh	prox	dist	sh
Tarsus	81.9	11.7	12.2	5.0	7.2	7.9	3,7
Tibia	97.0	11.3	11.5	5.7?	13.4	8.9	5.0
femur	65.7	12.6	13.5	5.8	10.3	11.0	6.3
leg	244.9						

		ext. prox	depth int prox	ba	ca
Carpus	55.0	11.8	13.9	21.4	24.3

		Gr. prox	dep. pr.	dep. dist.	Gr. dist	Gr. sh	dep. sh
ulna	104.0	11.6	10,3	8.3	9,3	5.2	5.8
		Gr. prox					
hum.	100.4	20.6	5.8	9.6	17.0	7.0	6.3

259.4

	a	b	c		ba	ca
	length	Gr. prox.	prox end int.			
cora.	43.4	9.6	13.3		22.1	30.6
			length keel	Ext. keel		
sternum	64.9	—	65.7	17.9		
	length		post. br.	ant br.		
pelvis	54.8		37.5	22.8		
cran.	85.1		18.0	17.7		

Skull

~~Skull~~

Beaks (Pit)

E4485 - 14 OK
E4805 - 13 OK
E3488 - 4
K6028 Dead OK
E2004 - 60 OK
F3158 - 16
F3159 - 16 OK

Scaps.

E4089 - 4
H6501 - 16
H6686 - 36
F1335 - 4
H6499 - 16
C8659
C8670
H6672 - 3
H6677 - 36
H6645 - 16

Cranium

E4217 - 4
E4182 - 4
E1813 - 67
E4363 - 4
E3731 - 4
E1052 - 16
E2560 - 3
E3699 - 4
E3539 - 4
E1478 - 16
E3376 - 4
E4019 - 4
E2037 - 2
F1623 - 3

Pelvis

E4678 - 13
D9254 - 14
E9619 - 16
E9618 - 16
J9522
D9083 - 3
E9617 - 16

Pit data Polybones bones; and on ensuing pages = all general measurements of fossil including ratios by Dwight.

Mandible

J9095
J9094
J9093
F2674 - 16
F2676 - 16
F2715 - 16
F2678 - 16
F2713 - 16
F2719 - 16
F2675 - 16

Left Coracoid

	length
E4330	50.5
H4584	46.3
E9837	48.3
E9310	47.1
E4401	46.6
F.9	47.6
E4802	45.5
E9605	50.2
E4784	47.5
E9841	48.3
E9865	47.7
H4644	46.7
E4721	47.7
H4536	49.0
F26	46.9
E1179	48.4
E2899	48.9
H4467	48.5
H4541	50.4
H4618	49.8
E9757	46.9
E3245	46.7
E4607	46.3
H4651	48.6
E9882	49.3
H4652	46.6
H4536	46.6
E9864	47.9
E4658	45.0
E3756	48.7
E4394	47.6
E9394	57.2
H4514	49.2
H4587	48.9
E2078	47.3

35) 1685.3 (48.1
140
285
280
53

	length
E4803	47.4
H4622	45.9
H4519	47.7
H4553	47.6
E1030	48.8
H4700	47.6
H4633	46.4
H4495	46.5
H4583	48.3
E2969	48.7
E9579	46.8
E4883	45.7
H4590	48.1
E1421	49.6
H4634	49.7
H4655	47.6
H4594	47.3
H4565	49.0
E4288	47.8
H4480	46.9
H4566	46.5
H4460	47.2
H4634	47.5
E1994	46.5
H4557	47.0
H4512	48.0

26) 1236.1 (47.5
104
196
182
141
130

Polygonus

1685.3
1236.1
2921.4 (47.8 mean
61
244
481
427
544

2921.4
43.6
69) 2877.8 (47.9
240
477
420
578

26
3
1
6

24
4
104
14
123

35
26
61
48
13

Left Coracoid

	length
E4330	50.5
H4584	46.3
E9837	48.3
E9310	47.1
E4401	46.6
F.9	47.6
E4802	45.5
E9605	50.2
E4784	47.5
E9841	48.3
E9865	47.7
H4644	46.7
E4721	47.7
H4536	49.0
F26	46.9
E1179	48.4
E2899	48.9
H4467	48.5
H4541	50.4
H4618	49.8
E9757	46.9
E3245	46.7
E4607	46.3
H4651	48.6
E9882	49.3
H4652	46.6
H4536	46.6
E9864	47.9
E4658	45.0
E3756	48.7
E4394	47.6
E9394	57.2
H4514	49.2
H4587	48.9
E2078	47.3

35) 1685.3 (48.1
140
285
280
53

	length
E4803	47.4
H4622	45.9
H4519	47.7
H4553	47.6
E1030	48.8
H4700	47.6
H4633	46.4
H4495	46.5
H4583	48.3
E2969	48.7
E9579	46.8
E4883	45.7
H4590	48.1
E1421	49.6
H4634	49.7
H4655	47.6
H4594	47.3
H4565	49.0
E4288	47.8
H4480	46.9
H4566	46.5
H4460	47.2
H4634	47.5
E1994	46.5
H4557	47.0
H4512	48.0

26) 1236.1 (47.5
104
196
182
141
130

Polygonus

1685.3
1236.1
2921.4 (47.8 mean
61
244
481
427
544

2921.4
43.6
69) 2877.8 (47.9
240
477
420
578

26
3
1
6

24
4
104
14
123

35
26
61
48
13

45 - 50
43 - 52

Right

43 - 47

		R't
H4565	47.2	16
H4479	47.6	16
H4576	48.9	14
H4554	48.0	16
E3656	47.9	4
E2534	45.2?	3
H4545	49.5	16
E3404	47.7	4
E4369	45.8	4
H4697	47.7	9
E727	45.8	-16
H4649	47.8	91
E3705	47.6	4
H4528	45.5	16
H4531	47.2	16
E2075	45.3	-2
E3967	48.8	-4
E4777	44.9	-13
E4574	46.8	-13
H4561	47.3	16
H4477	46.4	16
E4639	49.2	13
E925	45.3	-16
E3879	48.5	-4
E4368	46.3	-4
E4023	47.5	-4
H4510	46.1	16
E4767	46.5	-13
H4599	48.7	16
H4548	50.0	16 — Max
H4619	46.9	16
H4537	47.3	16 —
E3563	47.4	-4
E2604	46.8	-3
E1026	46.1	-16

38) 1651.5 (47.1
140
251
245
65
31

35.4
14.0
24

16.1
2.7
1.8.8

16

6.9.4
1.4.6

Polybomus caracoid Right

E1983	44.2	-60
H4484	46.3	-16
H4548	47.9	-16
H4487	47.4	-16
H4470	47.6	-16
H4584	45.8	-16
H4578	47.9	-16
H4570	45.1	-16
H4623	46.6	-16
H4501	47.4	-16
H4547	47.5	-16
H4577	48.7	-16
H4523	47.6	-16
H4478	48.6	-16
H4472	49.3	-16
H4491	47.6	-16
H4591	46.8	-16
H4648	47.0	-36
H4550	45.5	-16
H4606	47.3	-16
E904	48.2	-16
H4522	47.8	-16
H4526	46.2	-16
H4520	45.0	-16
H4593	45.0	-16
H4515	47.8	-16
H4560	47.6	-16
H4603	49.2	-16
H4490	49.0	-16
E3080	43.6?	-3
E4641	44.3?	-13
E1346	47.0	-16
E4625	47.6	-16
E4629	47.1	-16
E4389	47.2	-4
E645	49.1	-16
E14	47.0	-13
E1157	47.8	-16
E9786	46.9	-60
E3738	50.0	-4

40) 1885.1 (47.1
160
285
280
51

min

E9814	44.3	-4
E3823	48.0	-4
E2581	46.2	-3
E4984	46.1	-4
E1300	47.5	-16

5) 2321 (46.4
20
32
30
21

1651.5
1885.1
232.1

80) 3768.7 (47.1
320
568
560
87

min. max aver
43.6 - 50.0 - 47.0 ✓

ratio ♂
tarsus
53.2 — 52.6 — 53.2
chelinay - possibly
lutorius

ratio ♂ carpus
73.7 — 73.7 — 74.5

E4456	48.9
E928	45.0
E4874	47.8
E4438	47.0?
E929	46.6
E4272	44.9
E4624	46.5
E9308	46.3
E4743	44.4
~~E3243~~	46.0

10) 463.4 (46.3

H4466 - 4629 = R't
16
E3376 - 4488 - R't 4

1651.5
1885.1
232.1
463.4
143.2

35
40
5
10
3
93

93) 4375.3 (47.0
372
655
651
43

ratio
43.4 - 43.4 - 43.4
same as
lutorius & tharus

88 specimens
~~50~~ specimens

E4389	47.2
H4490	49.1
H4625	46.9

3) 143.2 (47.7
12
23
21
22

53.2
52.6
105.8
52.9

4374.3 (paired
920 (paired

95) 4467 (47.0
380
667
665
20

La Brea polygons left hemisphere

~~E327~~	~~115.5~~	16
F24	105.2	13
E1918	110.1	60
E4589	107.6	13
E957	109.1	16
E1518	106.9	16
E9558	110.7	16
E1378	112.1	16
E3372	109.1	4
E3670	114.7	4
E2967	111.1	3
E1080	106.6	16
E3864	111.6	3
E973	115.2	16
E1074	111.1	16
E2614	104.3	3
E879	112.2	16
E707	108.0	16
E1343	109.6	16
E547	105.6	14
E4375	110.3	4
E3264	100.3	3
E590	112.9	16
E1078	111.5	16
E1510	106.8	14
E3084	105.9	3
E1233	110.6	16
E3490	107.8	4
E766	107.2	16
E3375	104.6	4
E3925	107.2	4
E9378	109.9	16
E1620	108.6	14
E598	110.5	14

37 10.2
- 1 15.3
35 94.9

Total 3594.9
33 33

294
264
30 9
29 7

E3081	107.8	3
E718	109.6	16
E1312	113.0	16
E616	110.0	14
F24	105.2	13
E4712	109.4	13

1547.2
107.8
6) 655.0 (109.1
6

655.0
3594.9

424991 (108.9
39
39
349
312
379

Coracoid 48.5 – 11.3 – 15.0 – 23.3 – 30.9
45.5 – 9.4 – 14.7 – 21.5 – 32.3

E877	112.0	16
E9847	110.4	4
E4398	112.4	4
E1441	110.2	16
E776	110.3	16
E4795	108.8	13
E1902	102.0	67
E588	109.0	16
E9852	114.3	4
E596	105.9	16
E4356	112.0	4
E1804	109.1	14
E1318	113.9	16
E3255	113.4	3
E5994	109.2	13
E3424	104.8	4
E2517	109.0	3
E2459	111.8	3
E3909	110.8	4
E3927	110.7	4
E9556	107.8	16
E1327	115.3	14
E881	106.1	16
E777	109.8	16
E3526	112.4	4
~~E4442~~	~~105.3~~	4
E9561	112.1	16
E2552	104.0	3
E997	110.2	16

28 39
67

42499
30777
67) 732744 (109.3
67
627
603
246

28) 3077 (109.9
28
277
252
257

~~E1113~~

28
39
57

S. cheniway most.
S. thamsmon.

R.L.B. Polyporus
Falconidae

	Length	Breadth Prox ↔ dist.	de pth max ↓ dist
420	112.7	12.1	10.1 / 10.4 / 8.8
23	120.1	13.2	11.3 / 11.7 / 10.1
E 4698 ✓	116.4 -13	13.5	10.7 / 11.5 / 9.8
E 905 ✓	115.9 -16	12.5	10.4 / 11.3 / 9.2
E 1037 ✓	112.1 -16	12.2	10.5 / 11.0 / 9.9
E 3200	118.2 3	10.9	10.5 / 10.9 / 9.4
E 784 ✓	114.4 -16		
E 1583 ✓	118.7 -16		
E 975 ✓	118.9 -16		
E 4765	116.9 -13		
E 2570 ✓	117.0 -3		
E 617 ✓	122.0 -16		
E 1023 ✓	116.4 -16		
E 3515 ✓	118.8 -4		
E 3367 ✓	111.4 -3		
E 1218 ✓	112.2 -16		
E 3953 ✓	121.6 -4		
E 2562 ✓	112.7 -3		
E 1334 ✓	122.3 -16		
O 160 ✓	119.2		
E 998 ✓	115.7 -16		
E 1553 ✓	112.2 -16		
E 810 ✓	114.7 -16		
E 1006 ✓	113.8 -16		
E 1911 ✓	115.5 -16		
E 3[illegible] ✓	117.3 -4		
E 1313 ✓	117.5 -16		
E 1311 ✓	114.4 -16		
E 4648 ✓	116.7 -13		
E 631 ✓	112.2 -16		
E 3549 ✓	115.7 -4		
E 3074 ✓	116.9 -3		
E 999 ✓	117.0 -16		
E 714 ✓	120.1 -16		
E 342 ✓	117.5 -4		
B 9732 ✓	120.0		
E 1328 ✓	118.8 -14		

31) 4080.8 (116.0

72.7 thams 206
81.7 cheniq 734
78.8 Styptes

116.5 ave.

Styptes		max
767	103.9	11.9
thams 206	122.9	14.1
cheniq 786	115.8	12.4

84
114) 9410
8912
4980
735

1114) 8190
7798
3920
3342
5780

ULNA
R.L.B. Jour.

116.5
65) 8900
8155
7450
6990
460

31) 4080.8
31
38
31
30
2 10
20
5

763
743
20

114 763
5.2

Ratios of thams

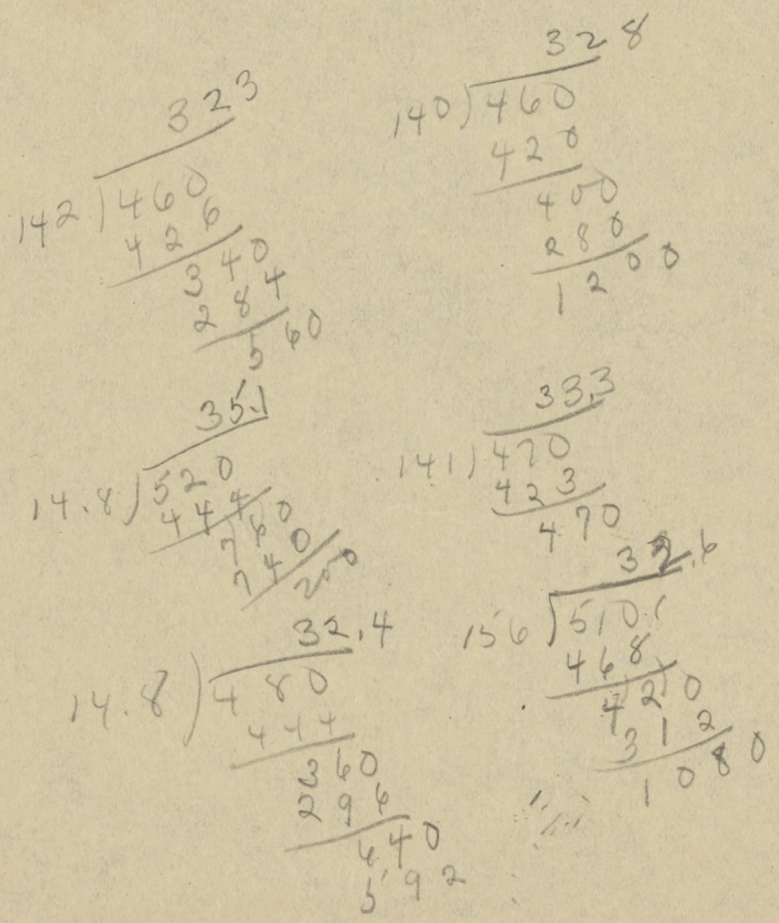
763.
8900
8155
7450
6990
460

815
1127) 9190
9016
1740
1127
613

cheniq
S. cantisper.
Bi 236

743
8930
8407
5230
4804
4260

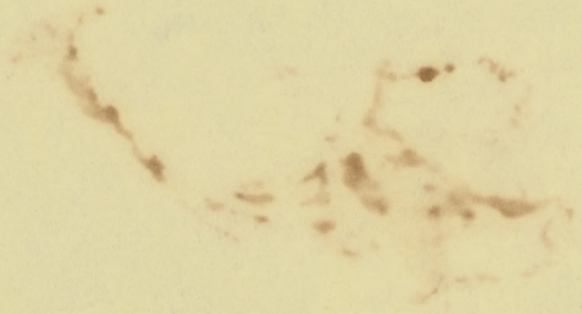
thams
cheniq
Lapp
mo. Bi 420



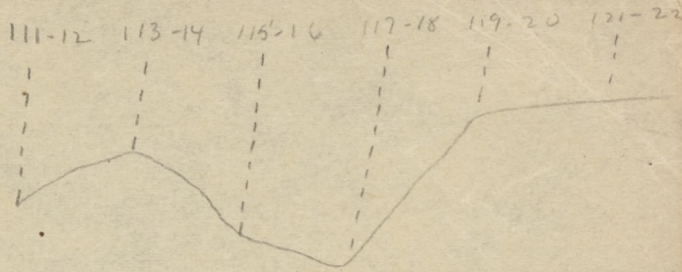
Ulna continued

E778 - 117.1
E4296 117.9
E3958 113.1
E3217 116.5
E4854 113.8
E1237 113.6
E837 112.3
F531 113.7
J9369 115.8
E4837 117.1
E1049 116.0
E3567 112.7?
E4675 116.6
E1981 114.1
E4295 119.7

15) 1730 70 (115.3
15
23
15
80
75
50



111	112	113	114	115	116	117	118	119	120	121	122
111.4	~~112.7~~	118.8	114.4	115.9	116.4	117.0	118.2	119.2	~~120.1~~	121.6	122.0
	112.1		114.7	115.7	116.9	117.3	118.9		120.1		122.1
	112.2		114.4	115.5	116.4	117.5	118.9		120.0		
	112.4			115.7	116.7	117.0	118.8				
	112.2				114.9	117.5	118.8				
	112.										



RLB Polyborus cheriway

112.7

Polytomous - chapman

E674 65.5 -4
E1376 61.6 -16
E4673 61.2 -13
E3310 66.3 -3
E2691 63.6 -3
E632 61.4 -16
E911 61.8 -16
E3945 63.7 -4
E4371 61.7 -4
E4655 59.3 -13
E1154 64.8 -16
E662 62.8 -16
E3721 63.4 -4
E4249 62.8 -4
E4044 59.7 -4
E1375 59.3 -16
E3295 66.2 -3
E2419 62.2 -3
E1680 61.4 -61
E1303 64.5 -14
E3737 66.6 -4
E3556 62.0 -4
E1282 65.5 -16
H2297 60.7 -16
E4744 63.5 -13
E3924 62.6 -4
E4810 61.9 -PD
E3028 61.0 -3
E602 63.6 -16
H2282 65.0 -16
E1042 64.7 -14
E3957 63.8 -4
H2238 63.0 -16
E938 61.7 -16
E1538 65.4 -16

35)2207.2(63.0
210
107
105
22

H2278 61.9 -16
E1401 64.1 -14
E1814 61.9 -67
E3731 65.8 -4
H2259 63.3 -16
E3565 62.7 -4
E3384 63.1 -41
E3897 65.0 -4
E4414 62.0 -4
E4722 65.4 -13
H2820 64.0 -16
J8761 62.4 -
E4301 65.1 -4
H2245 62.0 -16
E4189 64.7 -4
H2261 59.1 -16
H2280 60.7 -16
E689 62.2 -16
H2281 64.4 -16
H2301 62.1 -16
H2267 61.5 -16
H2285 62.6 -16
J8803 63.5 -
H2298 61.6 -16
E1047 64.1 -16
H2829 65.8 -16
J8805 65.4 -
H2302 60.1 -16
H3522 64.6 -16
H2290 61.0 -16
H2275 63.0 -16
J8752 61.5 -
H2810 64.6 -16
J8763 61.5
E2973 64.2 -3

35)2206.9(63.0
210
106
105
19

E1024 63.0 -16
H2284 63.2 -16
E1202 64.0 -16
E1132 64.8 -14
E962 65.2 -16
H2811 62.5 -16
H2286 60.4 -16
J8815 61.0 -
H2264 62.1 -16
E880 63.0 -16

10)629.2(62.9
2

2207.2
2206.9
629.2

80)5043.3(63.0
480
243
240
33

E98.2 - 62.9

A

H2218 -
H2303 - PD16
E36 - 338 - 13
345 - 449 - 61
450 - 574 - 67
588 - 1623 - 76
2098 - 2511 - 3 central
2512 - 3364 - 3
3370 - 4498 - 4

Left

Polygons

E3822 66.5 -4
E1522 64.6 -16
E3896 66.8 -4
E4317 66.0 -4
E4866 64.5 -P.D
E626 61.7 -16
E1337 65.8 -16
E3143 65.6 -4
E1949 64.3 -60
E1538 65.x -16
E1896 63.3 -67
E4271 61.8 -4
E4266 62.6 -4
E630 64.1 -16
E2071 63.0 -2
E1169 62.6 -16
H2836 62.5 -13
H2832 64.0 -16
J8781 63.7
H2284 62.6 -16
E3386 62.x -4
E3689 61.2 -4
E1268 64.x -14
H2833 64.0 -14
H2243 63.2 -14
E3889 60.2 4
E4780 64.2 13
E2108 61.9 3
H2257 59.5 -16
E1331 65.x -14
E1232 63.8 -16
E3222 63.9 -3
H2239 61.1 -16
H2266 61.2 -14
E1380 63.3 16
E958 67.8 < 16 max
E1200 66.2 -16

37)2355.7(63.6
222
135
111
247

E3391 62.0 -4
E3969 63.5 -4
E4820 64.0 -13
E1031 62.9 -16
E3263 60.7 -3
H2826 65.5 -16
E4612 62.1 -13
H2244 64.7 -16
H2293 62.9 -16
B9846 61.7 -
E3292 59.4 -3
H2316 64.1 -37
E4382 62.3 -4
E963 65.8 -16
E3828 59.2 -4
E1100 65.0 -16
E4809 62.0 -P.D
E4457 64.x -4
E815 65.0 -16
E4643 62.5 -13
J8781 61.6
E1811 64.0 -61
E1406 65.4 -16
H2272 62.9 -16
E1046 66.8 -16
H2232 63.2 -16
E4558 66.2 -77
H2258 59.1 -36
E4083 59.2 -4
E689 62.2 -16
E2182 65.6 -31
E1404 64.2 -16

32)2029.12(63.1
192
101
96
52

E9993 63.7

2355.7
2021.2

69)4376.9(63.4
414
236
207
299

4376.9
2207.2
2206.9
629.2

149)9420.2(63.2
894
480
447
330
298

36 28
6 6
216 168
5 20
14 14
235 202

B

50 62.9
69 63.7

2)126.6(63.2

9420.2
126.6

151)9546.8(63.2
906
484
453
338

fossil campus
with page A
complete
measurable
specs.

Right

32
37
80
149

~~63.7~~
~~9~~
~~2)127~~

Hermes Caracara

| | length | bz | rel str | | |

	dip ht	MI ht	Strodi ht	ext dep.	
206	7.8	9.5'	11.0	13.9	68.4
236	8.7	10.0	11.8	14.4	69.5'
736	8.3	9.2	11.0	13.4	68.6
739	8.5	10.2		13.1	78.0
	8.8	10.2	12.0		

	a ext dist	b ht	wt ht M.I	br mxy	da	ba	ca
739	13.2	12.1	9.0	6.4	48.4	91.7	68.1
736	13.4	12.0	9.6	6.3	47.0	89.6	71.6
206	13.8	12.5'	9.2	6.7	48.5'	90.7	66.6
236	14.3	12.7	9.4	6.7	46.7	88.8	65.6
E3721	14.3		9.6			67.1	
E1154	13.9		9.7			69.7	
E4249	13.5'		9.2			68.1	
E4662	13.7		9.6			70.0	
E4665	13.5		9.4			69.6	

x

Lake Chariton

Casper

Femur Polygons La Brea

	length		depth
	max		
E9992	73.0	13	12.6 — 17.—
E712	67.3	14	12.0 17.8
~~J9610~~	~~67.9~~		~~10.4~~ 15.9
F4795	65.7	-16	12.4 19.4
E4012	66.3	-4	12.0 18.1

E651	66.9	-14
F4808	63.7	-14
E922	67.6	-14
E3850	68.3	-4
E2638	63.8	-3
E4142	61.7	-4, Min

E943	66.3
E1053	64.1
E1344	69.4
E712	67.0
E996	63.3
E4402	62.5
E4466	65.8
F4703	64.4
E3610	65.6
F4794	65.2
E5883	66.2

17 | 1111.8 (65.4
102
91
85
68
68

17
6
10 2/9

8 5/6

E1315	67.9	-16
E1319	70.0	-16
E1150	67.7	-16
E1980	63.6	-60
E4723	65.5	-13
D7610	64.7	-4
F4825	65.3	-3
E984	68.9	-16
E864	66.1	-16
E4376	65.2	-4
E3218	62.2	-3
E1320	68.9	-16
E2660	64.4	-3
E3076	67.9	-3
E1112	65.4	-16
E4138	68.0	-4
E4677	65.8	-13
E1210	65.5	-16
E874	67.6	-16
E832	66.3	-16
E1048	65.0	-16
E1263	67.5	-16
E4012	66.2	-4
E730	67.4	-14
E1004	66.2	-16
E604	65.3	-14
max E9992	~~73.0~~ 72.8	-13
E3444	62.8	-4
E3283	64.8	-4
E716	64.3	-14
J9610	67.9	
E4427	64.2	-4
E3814	63.1	-4

3324.5 (46.2
198
~~104~~
119.8
2100 65

2284.5
1111.8
3296.3 (65.9
300
246
250
463

31
6
186

Polygonus – fa Prea Tibia

pit	length	dist Gr	dist dep.	Da	Cb	dist Gr / 4	dist dep / 4
E1482 (16)	105.0	12.3	9.4	11.7	76.4	7.6	4.7
E1483 (16)	104.7	12.9	9.3	12.3	78.2	7.8	4.5
E3978 (4)	106.6						
E1379 (16)	101.0						
E653 (16)	106.6						
E1246 (16)	110.3						
E4267 (4)	105.5						
E3910 (4)	108.2						
E4327 (4)	106.8						
E1487 (16)	106.4						
E3530 (4)	108.4						
E4596 (13)	105.0						
E1379 (16)	100.7						
E1470 (16)	104.3						
E3954 (4)	100.5						
E1542 (16)	105.8						
E723 (16)	107.5						
F6739 (9)	104.5						
E1228 (16)	107.7						
D7869 (4)	104.8						
E4762 (13)	103.7						
E4493 (4)	112.3						
E987 (16)	111.2						
E1174 (16)	107.0						
E4112 (4)	108.5						
E2055 (2)	106.5						
E4766 (13)	104.3						
E1003 (16)	107.3						
E3493 (4)	109.5						

J9745 – 102.2

F2063 – 109.7 Pit 16.

P60 J9674 – 105.3

P.13 E9664 – 107.0

4242

5'32.4 (106.3

9) 95 6.6

9

56

54

24

1479.5'

2133.4

3U3612.9 (106.2

34

212

204

89

1

1488.3

– 109.5'

1378.8

1401.7

14) 1479.5 (105.6

14

79

70

95

8

complete fossil Polygonus representation of tibia

1479.5

1601.1

424.2

5'32.4

38) 4037.2 (106.2

38

237

224

92

1488.3

1601.1

29) 3089.4 (106.5'

29

189

174

154

145

14

15

9

24

1601.1

532.0

20) 2133.4 (106.6

20

133

120

131

2

29) 61

58

3

Tibia 106.2 #

Tarso 89.0 ?

1

33) 61

33

28

15) 1601.1 (106.7

15

101

90

111

103

E872 109.8

E648 105.3

E1539 106.2

E982 106.0

532.4

Pt 4 - Polybrachia

Beak E4485
E3488

Cranium
E4217
E4182
E4363
E3731
E3699
E3539
E3376
E4019

Scapula
E4089
F1335

Humerus
E3372 - 109.1 M
3670 - 107.7
4335 110.3
3490 - 107.8 M
3335 104.6 M
3425 107.2 M
9847 - 110.4
4398 - 112.4
9852 - 114.3
4356 112.0
3426 104.8 M
3909 - 110.8
3927 - 110.7
3526 - 112.4
4442 105.1 M
15) 1646.6 (109.1

Ulna E3515 118.8
3953 121.6
3684 - 117.3
3549 - 115.7 M
3422 - 117.5
5) 590.9 (118.1

Carpus
E3965 - 63.7
E4331 61.7 M
E3721 63.4
4289 65.8
4086 59.7 M
3737 - 66.6
3556 - 62.0 M
3964 - 62.6 M
3957 - 63.8
3735 - 65.8
3565 - 62.7 M
3884 - 63.4 M
3897 - 65.0
4414 - 62.0 M
4301 - 65.1
4187 - 64.7
16) 1017.7 (63.6

E3822 - 66.5
3896 - 66.8
4317 - 66.0
3743 - 65.6
4271 - 61.8
4266 - 62.6
3386 - 62.4
3689 - 61.2
3584 - 60.2
3391 - 62.0
3769 - 63.5
4382 - 62.3
3828 - 59.2
4457 - 64.4
4083 - 59.2
15) 943.7 (62.9

Coracoid E3656 - 47.9
3404 47.7
4369 45.8
3405 47.6
3987 48.8
3879 48.5
4368 46.3
4023 47.5
3563 47.4
4384 47.2
3338 50.0
9814 44.3
3823 48.0
9904 46.1
14) 661.3 (47.4

Femur E3850 - 68.3
4142 - 61.7 M
D7610 - 64.7 M
E4336 - 65.2 M
4138 - 68.0
4012 - 66.2
3444 - 62.8 M
3283 - 64.8 M
4427 - 64.2 M
3814 63.1 M
10) 649.0 (64.9

Tibia E3978 106.6
4267 105.5 M
3910 108.2
4327 106.8
3530 108.4
3954 100.5 M
D7869 - 104.8 M
E4493 112.3
4112 108.5
3492 109.5
10) 1071.5 (107.1

Tarsus E4151 90.9
3652 81.9 M
4139 83.3 M
4081 86.8 M
4035 90.2
4184 83.4 M
3950 93.6
3382 90.5
3550 92.7
3855 92.0
3986 87.8 M
3936 88.4 M
12) 1061.5 (88.4

Pit 16 Polytomus

Beak
F3158
F3159

Cranium
E1052
E1478

Scapula
H6561
H6499
H6645

Pelvis
E9617
E9618
E9619

Mandible
F2674
75
74
78
2713
14
15

Carpus
E674 - 65.5
1376 - 61.6 M
632 - 61.4 M
911 - 61.8 M
1154 - 64.8
662 - 62.8 M
1375 - 59.3 M
1303 - 64.5
1282 - 65.5
H2297 - 60.7 M
E602 - 63.6
H2282 - 65.0
E1042 - 64.7
H2238 - 63.0 M
E438 - 61.7 M
1538 - 65.4
H2278 - 61.9 M
E1401 - 64.1
H2259 - 63.3 /
H2820 - 64.0
2245 - 62.0 M
2261 - 59.1 M
2280 - 60.7 M
E689 - 62.2 M
H2281 - 64.4
2301 - 62.1 M
2267 - 61.5 M
2248 - 61.6 M
E1047 - 64.1
H2824 - 65.8
2302 - 60.1 M
3522 - 64.6
2290 - 61.0 M
2275 - 63.0 M
2810 - 64.6
E1024 63.0 M
H2284 63.2
E1202 64.0
1132 64.8
962 65.2
H2811 - 62.5 M
2286 - 60.4 M
2268 - 62.1 M
E880 63.0 M

24 6/1

Rancho La Brea Polygonum

P. cheiranthifolium modern P. bistortoides modern

	pit	length	dist.	shaft	OD
420		91.9	14.0		15.2
~~2336~~		89.3	15.6 ✓		17.4
E4553		88.2	14.5 – 13		16.4 70
E698		89.1	15.3 – 16 ✓		17.1
E4151		90.9	14.0 – 4	15.6	15.4
E4833		89.0	14.9 – 13	—	16.7
E679		94.1	15.0 – 16 ✓	—	15.9
E1449		90.2	14.5 – 16	—	16.0
E1249		91.0	14.3 – 16	—	16.1
E1281		87.8	14.3 – 16	—	16.2
G2921		88.3	14.3	—	16.6
G2926		89.4	14.6	—	16.3
E4541		89.0	14.5 – 77	—	16.2
E761		91.7	14.5 – 16	—	15.8
E3090		93.3	14.3 – 3	—	15.3
E3652		88.0 89.9	14.1 – 4 min	—	17.0
E816		94.1	14.2 – 16	—	15.0
E603		82.9	13.8 – 16 ✓	—	16.7
E608		89.4	14.5 – 16	—	16.2
E3294		86.0	15.0 – 3 ✓	15.2	17.3

20)178.71
8.9.3

E4807 90.1 – 13.0 – 4.4
E3533 91.6 – 14.2 – 15.5
E1249 91.0 – 14.6 – 16.0 ave.
17.8
89.0 = ave.

84 60
2 2
168 mm
190

	pit	length	dist.	shaft	OD
E1471	16	84.7	14.2		16.7
E1555	16	85.4	13.7 ✓	15.2	16.0
E4139	4	83.3	14.2		17.0
E4081 juv.	4	86.8	13.5 ✓	—	15.4
E1373	16	84.3	14.2	—	14.8
E4035	4	90.2	14.3	—	15.8
E956	16	85.0 ✓	14.8		16.4
E748	16	85.3 ✓	—		
E3091	3	92.3 ✓	14.6	—	15.8
E4184	4	83.4	13.5 ✓	—	16.1
E3950	4	93.6	15.0	—	16.0
G2972		84.0	14.2	—	16.9
E820	16	92.2	14.7	—	15.9
E1308	16	89.5	14.7	—	16.4
E3392	4	90.5	13.6 ✓	—	15.0
E3550	4	92.7	14.3	—	15.4
E1529	16	92.2	14.8	—	16.0
G2901		91.0	14.5	—	15.9
E3069	3	87.9	14.1	—	16.0
E937	16	89.6	14.4	—	16.0
G2941		92.2 ✓	14.6	—	15.8
E1450	16	89.9	14.8	—	16.4
E819	16	91.06	14.5	—	15.7
E1129	16	88.8	14.6	—	16.4
E3855	4	92.0	13.6 ✓	—	14.7
E681	16	91.2	15.0 ✓	—	16.4
E4654	13	87.9	14.5	—	16.4
E3984	4	87.8	14.8	—	16.8
E3936	4	88.4	14.6	—	16.8
E1535	16	91.3	14.5	—	15.9

Schyster Lot Miller 764 81.9 12.3
P. brauns " 206 89.4 14.8
P. cheiranthifolium " 736 94.7 14.1

Sciurus - Tamiasciurus Hylocrous chinensis

		length	distance	shaft		
B ♂ juv			13.6	5.7	— Cameron Co. Tex	16.3
39385	—	89.5	14.6			
39384	—	87.0	13.7 12.7	5.0	" "	15.7
♀ 1 year old			17.3	7.3	Florida	17.8
43189	—	95.5	16.3			
♂ ad		88.9	14.9	6.1	— Texas.	16.5
43194	—		13.7			
♂ juv.		95.5				
43188	—	91.4	16.4	6.8	Florida	16.9
		45.72	15.4			

Dr. Bishop's coll.

91.4
5) 457.2

	a length	g prog	ba
E 4511	88.0	12.2	13.8
E 3199	86.3	13.7	15.8
E 2979	87.3	12.7	14.5
E 785	86.9	12.7	14.6
E 4081	86.8	12.6	14.5
E 4830	86.0	13.1	14.7
E 1485	91.7	13.4	14.3
E 924	90.9	12.9	14.1
G 2850	88.9	13.4	15.0
E 1699	87.5	13.7	15.4
E 882	90.4	13.1	14.5
E 2981	90.0	13.5	14.9
E 679	94.1	13.0	13.8
F 2046	88.3	12.9	14.4
E 1431	84.7	12.8	14.2
G 2921	88.3	13.5	15.3
E 871	92.7	13.4	14.4
E 4035	90.2	13.0	14.4
E 3382	90.5	12.8	14.1
E 819	91.8	13.4	14.5
E 4068	[illegible]	13.2	15.3
E 4151	90.9	12.8	14.0
E 1499	90.1	12.7	14.0
E 748	85.3	13.1	15.3
E 3090	93.4	12.8	13.7
E 3950	93.6	13.0	13.8
E 2771	88.8	12.8	14.4
E 820	92.1	13.7	14.8
G 2958	91.8	13.7	14.9
G 2926	89.4	13.4	14.9

85.3 – 94.1

Tarsus polymorphism

from RLB

	a	b	
E 784	114.7	12.5	10.9
B 9732	120.3	13.0	10.9
F 1411	105.6	13.1	11.3
E 3549	115.8	12.4	10.7
E 9153	121.8	13.7	11.2

Ulna
Polytoxon
Rds

81	82	83	84	85	86	87	88	89	90	91	92	93	94
81.9	82.9	83.3	84.7	85.4	86.0	87.8	88.2	89.3	90.9	91.9	92.3	93.3	94.1
		83.4	84.3	85.0	86.8	87.9	88.3	89.1	90.2	91.0	92.2	93.4	94.1
		166.7	84.0	85.3	172.8	87.9	88.8	89.0	90.2	91.7	92.7	186.9	188.2
			257.0	255.7		87.8	88.4	89.4	90.5	91.0	92.2		
						351.4	353.7	89.0	361.8	91.8	92.2		
								89.4		91.8	92.0		
								89.5		91.2	553.6		
								89.6		91.3			
								89.9		731.7			
								804.2					

RLB Previous Totals

81.9
82.9
166.7
257.0
255.7
172.8
351.4
353.7
804.2
361.8
731.7
553.6
186.9
188.2

51) 4588.5 (89.1
408
468
459
9

Polyborus from Dead Pit.

Coracoid	Tarsus	Humerus	Ulna	Femur	Carpus
K5934 45.0	K6042 85.1	K6009 105.8	K5952 – 109.9	K5999 66.0	K6077 57.8
K5935 45.2	K6055 86.2?		K5942 – 112.1	5993 63.3	6073 62.2
K5933 46.4	K6047 88.3		2) 222.0	5988 62.5	6076 59.6
K5929 45.9	K6048 86.3		111.0	5990 64.5	3) 179.6
K5936 45.6	99 K6061 89.0			6000 65.0	59.8
K5924 45.1	99 K6054 89.5			5989 64.8?	
K5926 46.5	6) 525.4 (87.0			6) 386.1 (64.3	
K5925 47.8	48			36	
K5931 47.4	42			26	
9) 414.9 (46.1				24	
36				21	
54					

45.0 - 47.8 - 46.1 | 85.1 - 89.0 - 87.0 | 105.8 | 109.9 - 112.1 - 111.0 | 62.5 - 66.0 - 64.3 | 57.8 - 62.2 - 59.8

Ratios

Cora & tarsus 52.9 - 53.7 - 53.0
" " hum. 43.6 cap.
Carp. " " 56.6
" " ulna 52.6 - 55.4 - 53.8
femur " 77.6 - 79.3 - 78.4
" " hum. 82.7 —
car. & carp 77.8 - 77.8 - 77.0

60.9 – 5 2.0

46.4
45.6
92.0

Polybouus – skull

Cranium

	a height from basi-oc. to central top (in the valley)	b breadth across top at widest pt. (inside of projections)	c breadth of narrowed portion ant. to cran. proper	B	ab	ca	cb
Thanus							
206	28.3	37.9	19.5	74.7	69.0	51.5	
234	29.8	39.1	22.8	76.2	76.5	58.4	
cheriway							
734	28.4	40.1	21.3	70.8	75.1	53.2	
739	28.6	41.1	21.6	69.7	75.7	52.6	
La Brea							
E4217 ✓	28.7	38.2	18.8	75.2	65.5	49.3	
E4182 ✓	28.3	38.2	17.5	74.2	62.0	45.8	
E1813 ✓	27.0	36.4	17.1	74.3	65.6	48.7	
xE4363 ✓	27.1	38.7	20.0	70.1	73.8	51.3	X?
E3731 ×	28.9	38.2	—	75.6	—	—	
E1052 ×	28.2	38.5	—	73.3	—	—	
E2160 ×	28.4	38.6	—	73.6	—	—	

The cranium of the La Brea bird resembles P. Thanus more than cheriway in relative ht. to breadth (except for one specimen which falls in with cheriway - E4363 from Pit 4). In breadth of the anterior portion, however, it is distinct from either form being narrower (again except E4363 although even this is .2 mm below the lowest ratio)

—

THH II

40
80
18
4
1
143

Polyborus skull

Beak

	a ht.	b breadth	c length ext. nares	d gr. br. ext. nares	ba	dc
Thanus						
206	15.0	14.6	5.7	2.8	97.4	49.2
234	15.1	14.6	6.1	2.6	96.7	42.4
cheriway						
736	15.7	13.7	6.7	2.5	87.4	37.3
739	16.2	14.5	6.6	2.5	89.6	37.9
420	16.5	14.0	7.2	2.4	84.9	33.4
Lapaea						
E4485	13.9	15.2	5.4	2.6	109.%	48.2
E4805	13.6	13.4	6.4	3.0	98.7	46.8
EB488	—	—	5.3	2.8	—	50.0
E2004	—	—	5.7	2.6	—	45.6
F3158	—	—	5.7	2.7	—	47.4

→ considered using E.4485 as type of new sp.; later chose humerus as type, in trial

The beak in the fossil is broad - perhaps even broader than in Thanus. The external nares are relatively short and broad as in Thanus.

In general the skull of the fossil is closer to Thanus than to cheriway

The picture we have of the skull is of a relatively narrow cranium, quite narrow anterior portion of cranial region with a short, low broad beak.

Line at bridge of beak and line below nares to ramus are more posterior with respect to the nares than in cheriway and the lower line slants off posteriorly below the naris to join the ramal edge well posterior to the naris. Closer to Thanus + Lutosus than cheriway. Only in smaller size + short distance from nares to ramus does fossil differ from Lutosus.

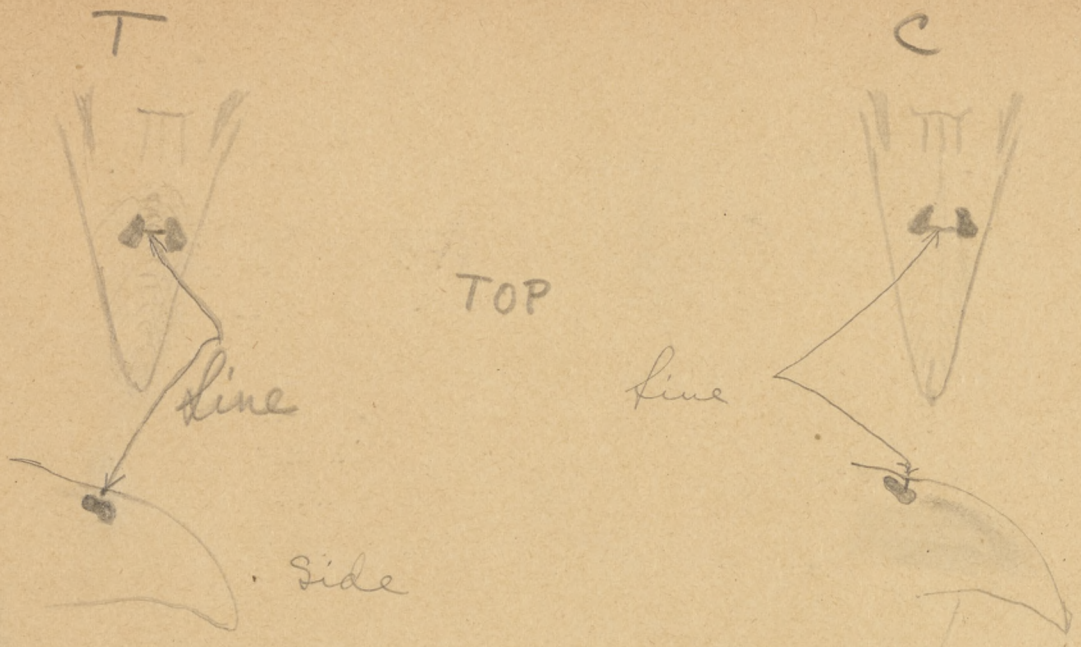
Cranium

	a height	b max. breadth	c length	d auric. width	ac ✓	ec ✓	dc	ab
Thames								
206	28.6'	32.4	50.7	17.0	56.2	64.0	33.5'	88.0
236	30.1	33.7	51.0	18.1	59.0	66.0	35.5'	89.5'
18478	30.2	34.6	52.9	20.4	57.0	65.4	38.5'	87.3
18476	30.0	33.6	51.7	20.0	58.0	65.0	38.7	89.3
cheriway								
736	28.6	32.7	53.5'	17.5'	53.4	61.1	32.7	87.5'
19670	28.3	34.7	53.1	18.1	53.3	61.7	34.1	81.8
19671	28.1	32.9	54.3	16.9	52.8	60.7	30.2	87.3
321805'	28.9	32.9	53.1	17.5'	54.4	62.0	33.0	87.8
739	28.6	33.7	54.3	16.1	52.7	60.3	29.7	87.5'
322338	28.4	32.6	53.1	17.2	53.5'	61.5'	32.4	87.3
fossil								
E1813	27.2	31.3	48.8	16.4	55.7	64.2	33.6	89.7
E3699	27.6	33.2	50.6	—	54.6	65.6	—	83.2
F3539	27.8	33.2	51.3	17.1	55.3	64.7	33.4	83.8
E4217	28.7	32.5'	50.0	16.3	57.4	65.0	32.6	88.4
E4182	28.5'	31.7	50.6	17.8	56.4	62.7'	35.2	85.9
E4014	~~30.0?~~	32.7	49.2?'	18.3	—	66.6?'	37.3?'	—
E3376	27.9	32.4?	50.0	—	55.8	64.7?'	—	86.1
E4478	~~29.0?~~	33.6?	51.7?	16.8	—	64.9	32.3	—
E2037	28.2	31.5'	49.5?	17.6	57.0?'	63.4	35.6	89.6
F1673	27.9	33.0	51.2	—	54.6	64.5'	—	84.5'
E2560	28.2	32.6	50.0	—	56.4	65.3	—	86.5'

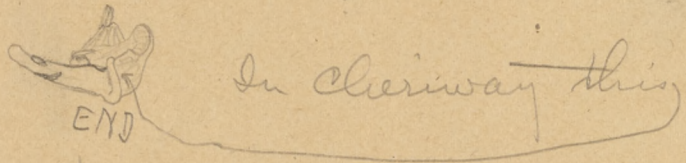
Cranium

fossil	a bi. post	b height at center	c bi. frontals at supraorbital sulcus	ba	d bi. parietal crest	bd	ad	ca	e basal bi.	eb
F3539	33.2	27.7	17.0	83.4	38.2	72.5	86.9	51.3	18.6	67.3
E3699	33.3	27.5	—	82.5	39.5?	73.4	88.7	—	18.5	67.4
F1673	33.0	27.7-8	17.4	84.1	37.8?	73.4	87.4	52.7	18.7	67.4
E4217	32.6	28.7	16.8	88.0	38.1	73.4	84.6	51.6	17.8	62.0
E2037	31.6	27.9	18.1	87.4	38.2	73.1	82.7	57.4	—	—
E4182	31.8	28.2	14.0	88.7	38.2	73.9	83.3	51.7	18.5	63.4
E4363	32.5	27.0	17.1	83.1	38.3	70.5	84.8	52.8	18.8	69.6
F1813	31.4	26.9	16.5	85.6	36.0	74.7	87.3	52.6	—	—
Dutoms										
1991.6	32.5	28.4	19.0?	87.4	38.5	73.8	84.5	58.5	20.8	71.5
Thams										
236	33.8	30.0	17.6	88.8	39.0	77.0	86.6	52.2	17.9	59.6
206	32.5	28.3	17.7	87.1	38.0	74.4	85.6	54.5	18.4	65.0
18478	34.7	30.1	20.3	86.8	41.2	73.2	84.4	58.5	20.0	66.5
18456	33.5	29.6	19.9	88.4	39.0	75.9	85.9	59.4	18.7	63.3
Cheniway										
739	33.6	28.5	16.8	84.8	40.8	69.7	82.4	50.0	18.4	64.6
19671	32.9	28.4	17.6		39.0	72.7	-	54.2	18.8	66.3

Beak



Mandible



In Cherivay this is short & wide

In Cherivay This line
ant. to membrane nares on
line w/ the ant. edges of nares
In Quadeliga this line
appears to run right into
the membrane (the middle of the nares ab.)
membrane nearer top of
naris in cherivay central
or toward bottom in Q.
naris of Q. more rounded (just to
does not have the notch at bottom
of cher.

Cranium

a = height c = length of cranium
b = width
(?) = broken

	No.	a	b	a/b	c	a/c	b/c
Thams	206.	28.5	32.7	87.2	50.8	56.1	64.4
	236	30.0	34.0	88.3	51.1	58.7	66.5
	18478	30.1	34.9	87.3	52.9	56.8	66.0
	18456	29.8	33.7	88.5	51.7	57.7	65.2
Chariway							
	736.	28.6	33.1	86.4	53.8	53.2	62.3
	19670.	28.3	34.9	81.2	53.1	52.1	65.7
	739.	28.3	~~33.7~~ 37.2	82.7	54.3	52.1	68.0
	321805.	29.1	33.5	86.8	53.1	54.8	63.2
	1043.	29.3	36.0(?)	81.5	broken		
	322338.	28.7	33.0	87.0	53.1	54.0	62.2
	19671.	28.7	33.1	86.7	54.3	52.8	61.0
Fossil							
✓	E 4217.	29.0	32.8	88.5 T	50.0	58.0	65.6
✓	E 3699.	27.7	33.7 (33.2)	82.3 C	53.0 (52.9)	52.3	63.7
✓	E 4182.	28.5	32.0 (31.7)	89.1 T	50.7 (50.6)	56.3	63.2
✓	E 3539.	27.8	33.2 (33.7)	83.5 C	51.4 (51.3)	56.0	64.8
	E 1478.	29.2(?)	33.7(?)	83.1 C	51.9?	54.0	65.0
✓	E 3376.	28.0	32.4(?)	86.5 C	49.2 (50.0)	57.0	65.9
✓	E 2560.	~~27.6~~	32.9	84.5 C	50.2	55.0	65.2
✓	E 1813.	27.2	31.5	86.4 C	48.7	55.9	64.8
	E 4019.	29.3(?)	~~33.6~~ 32.7	87.9 T	49.3?	60.2	68.5
✓	E 2094.	~~28.8~~ 28.2	32.0 (31.5)	88.2 T	49.5?	57.0	64.7
✓	F 1673.	~~28.8~~ 27.9	33.0	84.0 C	51.8	53.7	63.9

64 — 66
63 — 68
61 — 65

E 3699 is shaped differently on back of cranium

a = distance from naris to rostrum
b = " between nares at bridge
c = breadth beak at base (part of beak equal to part of naris)
d = depth " at ant. edge of nares
e = length beak
f = distance tip of beak to ant. edge of nares
g = angle at tip to post. notch

fossil	a	b	c	d	ba	ac	bc	cd	ad	bd	length	f	g	ge
E 2004	8.8	5.7	—	—	61.6	—	—	—	—					10.7
E4805	7.9	5.3	11.8	12.6	68.1	67.0	44.4	93.7	62.6	42.0	22.5	—	10.6	45.0
E4485	8.7	5.3	12.8	13.2	60.9	68.0	41.7	97.0	65.9	40.2	21.5	14.6	10.6	49.4
E8488	8.2	—	12.2	—	—	67.2	—	—	—					
K6028	8.7	5.8	—	—	66.7	—	—	—	—	—	—	—		10.3
Thames														
236	10.2	5.7	13.2	14.2	56.9	77.4	43.2	93.0	71.9	40.2	—	16.9	9.7	—
206	10.2	5.7	12.3	13.8	56.9	77.4	46.3	88.6	73.4	41.0	23.8	17.6	9.7	40.7
18478	10.5	6.4	12.1	15.6	61.5	87.9	52.9	78.9	67.7	41.0	21.9	19.0	10.7	39.8
18456	10.8	5.4	12.3	14.3	51.9	84.6	43.8	86.0	72.6	37.9	23.8	17.0	10.0	42.2
cheniway														
739	11.0	5.2	11.9	15.7	47.3	92.5	43.6	95.7	70.1	33.1	25.3	18.6	9.8	38.7
1073	11.3	5.8	12.2	16.3	51.4	92.7	47.5	94.9	69.4	35.6	25.8	17.7	9.7	37.6
736	11.0	5.7	12.2	15.5	51.7	90.3	46.6	98.7	71.0	36.8	25.7	17.80	9.8	38.1
19671	10.9	5.2	12.1	14.8	47.6	90.3	43.0	81.8	73.7	35.1	24.4	18.2	9.8	40.1
322338	11.2	5.6	—	—	50.1	—	—	—	—	—	24.9	17.8	10.0	—
420	11.0	5.6	12.1	15.9	50.9	91.0	46.3	96.3	69.3	35.2	25.3	16.3	10.0	39.6
321805	11.1	5.7	—	15.7	51.4	—	—	—	70.7	36.2	26.5?	19.4	10.3	38.9?
19670	11.3	5.7	11.8	15.5	50.4	95.7	47.3	96.3	73.0	36.4	24.0	17.2	10.1	42.1

Distance from lower edge of nares to rostrum less than either Thames or cheniway & less rel. to breadth, depth of beak & to distance bet. nares.

Distance between nares greater rel. to depth of beak: Thames & cheniway & Thames overlapping. Thames tends to be greater here also.

Beaks

Latest measurements on chart sheets (yellow) dated June 11, 1937 attached

The fossil is easily separated from cheniway and linked with Thanus or lutosus on the basis of the following characters:

① Beaks broader, shorter & lower
② Position of nares relative to line at bridge of beaks and line below nares to ramus:— In cheniway both lines are approximately even with the ant. border of the nares while in the other 3 forms they are decidedly posterior to this point & the lower line slants off posteriorly toward the ramal edge.

The matter of distinguishing the fossil from Thanus or lutosus is more difficult.

1. In actual size the fossil is smaller (except for breadth) than either Thanus or lutosus as rep'd by avail. specimens. It is altogether possible, however, that lutosus might reach as small a size.
2. In relative breadth the beaks surpasses Thanus, but ~~overlaps~~ includes the meas. of lutosus.
3. The one character which is not equalled in either Thanus or lutosus is the very short distance from the lower edge of the nares & the edge of the ramus — both in actual meas. & in meas. rel. & breadth. This distance is less in the fossil.

X = distinct

Different from other Caracaras

1. actual size —

X? (a) Length (measured from anteriormost perforation to tip of naris)

21.6 – 22.9 fossil
24.1 lutosus
24.3 – 26.5 – tharus
26.2 – 27.5 – cheriway

X? (b) Height (measured just anterior to roughened ridge on bridge)

12.8 – 13.6 – fossil
14.5 – lutosus
14.3 – 16.0 – tharus
14.6 – 15.4 – cheriway

X (c) Distance from lower edge of naris to ramus

7.6 – 8.8 – fossil
9.3 – 10.1? – lutosus
10.0 – 10.5 – tharus
10.6 – 11.1 – cheriway

(d) Breadth of beak (measured just anterior to roughened line at ramal border)

13.0 – 14.8 – fossil
14.3 – 15.0 – lutosus
13.7 – 14.8 – tharus
12.6 – 13.5 – cheriway

2. Ratios

(a) Breadth to length – includes lutosus

59.2 – 67.6 – fossil
62.3 lutosus
56.0 – 57.5 – tharus
44.5 – 49.1 – cheriway

X (b) Distance of nares from ramus relative to breadth

58.5 – 60.3 – fossil
62.0 – (70.3?) – lutosus
69.0 – 75.0 – tharus
81.5 – 87.4 – cheriway

(c) Breadth to height – includes lutosus

101.5 – 111.0 — fossil
103.4 – lutosus
92.5 – 98.0 – tharus
79.3 – 89.1 – cheriway

(d) Height to length

58.3 - 62.4 fossil

57.[illegible] - 60.3 lutonus

57.6 - 60.4 thanus

53.7 - 59.6 cheniday

Beak

	beak prep. to lower nails	beak	curve to top of nails	at diam. curve of tongue to bridge	Ratio of Beak to Body	ratio wt to body	Ratio dist from nares to ~~tip~~ tongue
1220	18.8	28.4		23.7	52.7	64.6	
32238	20.3	27.63		24.3	52.9		
736	22.0	29.3		25.0	49.3		
1043	21.5	29.3		25.6	50.0		
19670				24.6	51.3		
321805				26.4	—		
19671				23.6	55.2		
739				24.4	53.3		
420				24.0	56.3		
				9)22 16 (24.6			
lutrius	18.4	26.6	24.6	23.5	65.3	61.7	39.8
E4485				20.7	71.6	64.3	42.0
E4505				20.3	65.2	63.2	39.4
E2077				20.9		64.2	
K6028				20.1		67.7	
F3159				20.11	22.7	66.2	39.1
thamo 18456				27.7	61.7	63.0	
18478				24.4	59.5	64.3	
206				23.0	59.4	61.0	48.6
				3)17 06 (23.3			

Beale
cont'd

Bar	ca		da
62.0	60.3	5.0-5.3	39.3
67.6	61.6	24-5.8	37.0
59.2	58.3		34.8
	58.6	47-5.8	37.5
	62.4	5.3	40.3
62.3	60.3	6.2-5.3	38.6
56.4	57.6		41.3
57.5	58.6	5.3-6.8	
56.0	60.4	6.4-8.4	
—	—	6.4-6.6	
C			
47.2	59.6	4	
44.6	55.7		
44.5	53.7		
48.3	57.7		
47.6	—		
46.8	57.9		
49.1	56.7		

53.7 - 59.6 60.3

57.6 - 60.4

58.3 - 62.4

Reals

	a	b	c	d	e	f	dc	ef	bc	de	x	y	eg	fg	fh	hb
	length of dia.	breadth at dia. between anterior processes	height at dia. from nares to ventral area behind	distance of first nare from tip of snout	Distance between nares at top	Distance between nares at bottom					length of nares	greatest dist. of nares apart			palatal length	
fossil																
E4485	14.8	8.7	13.3	5.3	8.0	58.7	66.3	111.0	65.4	5.6	10.4	50.9	60.2	12.8	86.5	
F315	14.6	8.0	13.3	5.6	7.9	54.7	70.4	109.9	60.2	6.1	11.2	50.0	59.4	13.5	92.5	
E4805	13.8	7.6	12.8	5.3	7.0	57.4	66.3	101.5	59.4	6.1	10.7	49.5	62.5	14.5	107.2	
E2004	—	8.6	13.4?	5.6	8.3	—	67.5	—	64.2?	5.7	11.4	49.1	61.9	—	—	
K6028	—	8.8	13.6?	5.6	8.0	—	70.0	—	64.6?	5.6	10.8	51.8	58.8	—	—	
E3488										5.6						
	42.4		66.4													
P. lutosus																
199.6	15.8	9.3	14.5	6.0	8.7	60.7	69.0	108.4	64.2	6.2	11.3	53.1	60.0	12.8	85.4	
P. thamus																
206	13.7	10.0	14.0	5.6	7.9	73.0	70.9	97.9	71.5	5.6	10.2	54.9	56.5	13.1	95.4	
184	14.0	10.5	14.3	5.5	8.0	75.0	68.7	98.0	73.5	6.1	10.6	51.9	56.0	14.8	105.7	
1847	14.6	10.2	16.0	6.4	8.4	69.0	76.2	92.5	69.7	7.5	11.3	54.6	52.5	14.3	96.6	
236	—	10.3	—	5.5	8.2	69.6	67.0	—	—	5.9	11.0	50.0	—	—	—	
P. cheiriu																
1220	12.5	10.4	15.3	5.2	7.7	83.3		81.7	68.0							
32180	—	11.1	—	5.7	8.0	—	71.4	—	—	6.8			—	—	—	
19670	12.6	11.0	15.9	5.7	7.8	87.4	73.1	79.3	69.3	6.0	10.6	53.7	49.1	15.5	123.0	
19671	13.0	10.6	14.6	5.3	7.3	81.6	72.6	89.1	72.7	6.4	10.2	52.0	50.0	14.4	110.9	
736	12.3	10.7	14.8	5.7	7.6	87.1	75.0	83.2	72.4	6.5	10.3	55.4	51.3	15.2	127.5	
739	13.0	10.8	15.4	5.5	7.1	83.2	77.5	87.9	68.4	6.6	10.1	54.5	45.5	15.3	117.8	
322338	12.6	10.7	—	5.8	7.5	85.0	77.4	—	—	6.7	10.7	54.3	—	15.4	122.1	
1043	12.8	11.1	15.8	6.0	7.5	86.8	80.0	81.1	70.3	6.2	10.4	57.9	47.4	16.4	128.1	
420	13.5	11.0	15.6	5.6	7.7	81.5	72.7	86.5	70.3	7.1	10.0	56.0	49.4	—	—	

	fossil	lutosus	thamus	cheiriu
Br. to ht	101.5-111.0	103.4	92.5-98.0	79.3-89.1
ht of nares				
breadth just dist of nares apart	58.5-60.3	62.0	69.0-75.0	81.5-87.4
dist of nares apart top & bottom	66.3-70.9	69.0	67.0-76.2	71.4-80.0

lutosus

lutosus near but not exact

lutosus & thamus

Polyborus
Beak

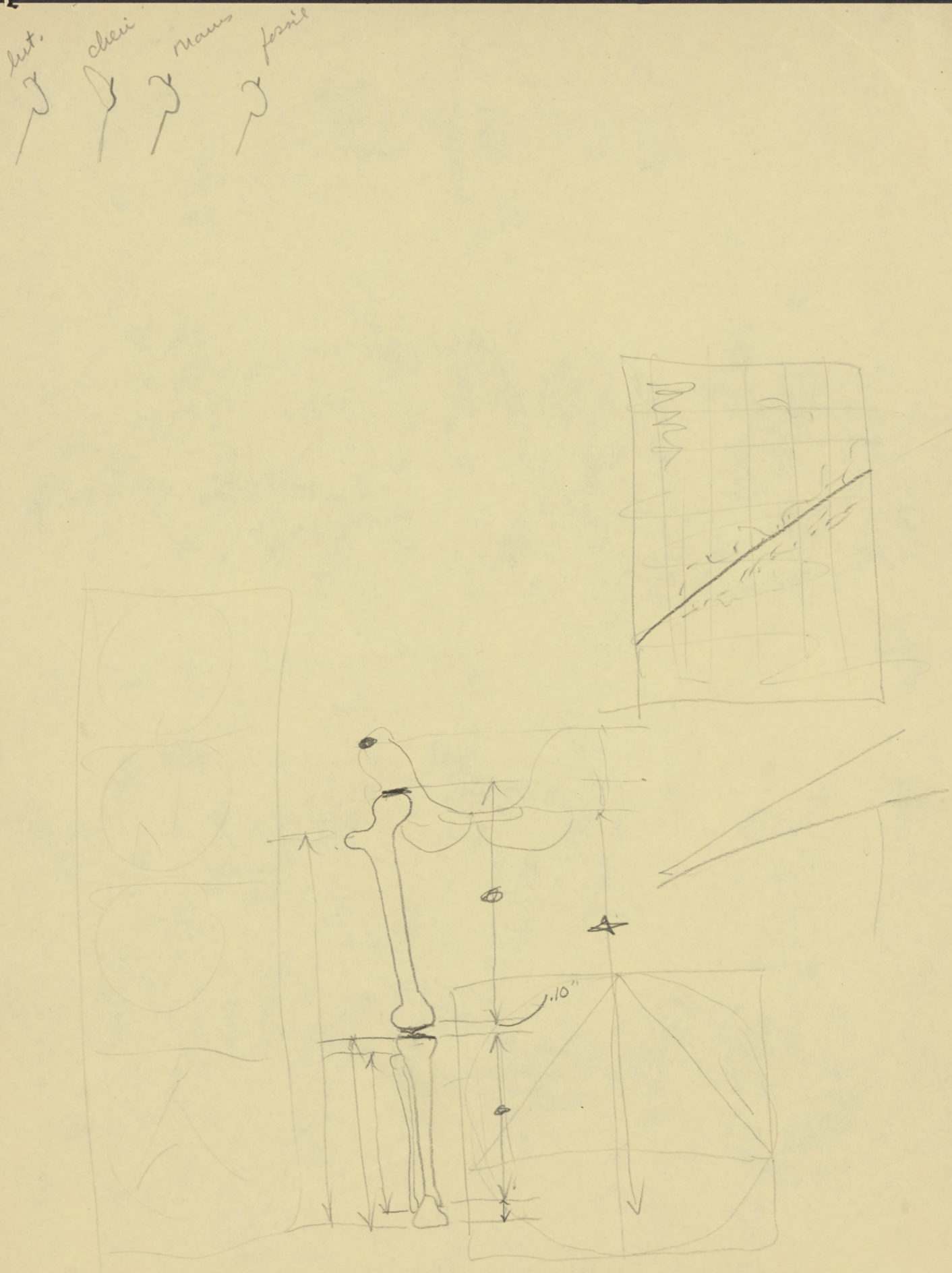
Cheriway differs from lutosus, Thamus & fossil in relative positions of posterior edge of smooth part of beak proper & the nares. This edge is directly under & in a straight line / the nares in cheriway but slants posteriorly from the lower edge of the nares in the Mus Mus.
It takes off about on a line with the anterior edge of the nares while in the Mus it takes off from the posterior edge & slants back even beyond this at the edge of the ramus.

Cheriway differs from the Mus also in the rel. position of the cere edge (at bridge) - this is practically level with the ant. edge of the nares in c., set about mid way back in Thamus & 3 mms of the fossil - & well back in l. & 4 of fossil.

Palatal portion —

fossil	E 4805	feat slightly undulated (shallow valley)
	E 4485	" " "
	F 3154	" " "
lutosus		feat
Thamus	206	good valley
	18456	" "
	18478	" "

Alexinus — shallow valley.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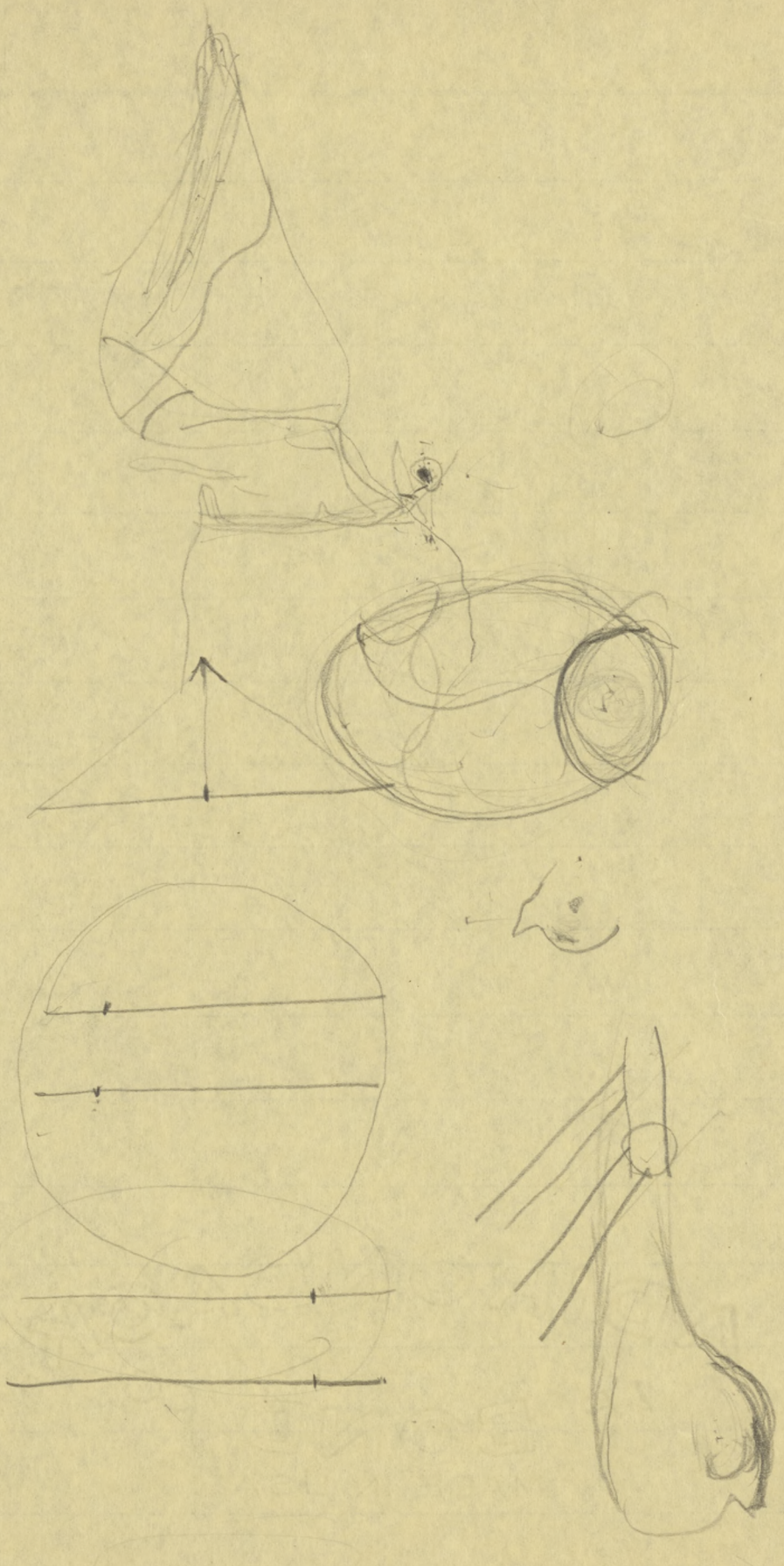
June 11, 1937

Beach

	Length a	Length from tip of nares to tip of premaxilla	Length from tip of premaxilla to end of nares	Breadth b	Nares to nares	Height d	Br to length ba	Nasal distance to length ca	Height to length da	Nares to breadth cb	Nares to height cd	Br to Ht bd
E4485	23.2	18.8	6.6	14.8	8.8	14.6	63.8	37.8	63.0	59.4	60.2	101.4
E4805	22.4	17.3	7.3	13.0	7.6	14.4	58.1	33.9	64.3	58.4	52.7	90.3
F3159	21.6	16.7	7.1	14.4	8.0	14.5	67.6	37.0	67.3	54.7	55.2	100.4
E2004	23.9	18.3	9.8		8.7	15.0?	—	36.4	62.8		58.0	—
K6028	22.0	17.0	6.7	13.7?	8.7	14.4?	62.3?	39.5	65.5	63.0	60.4	95.2?
E3488	5)113.1		6.7				—					
E3158	22.6		6.9				—					
Lubomo 19916	24.5	18.5	7.2	15.1	9.3	16.0	61.6	37.9	65.3	61.6	58.2	94.4
Thiaus 18478	27.1	20.4	8.0	15.1	10.6	17.8	55.7	39.1	65.7	70.3	59.6	84.9
18456	24.8	18.8	7.0	14.2	10.5	16.6	57.3	42.3	67.0	74.0	63.3	85.4
206	24.6	19.6	6.2	13.9	10.2	15.6	56.2	41.2	63.0	73.5	65.5	89.2
236	25.4	19.6	7.0	14.7?	10.2	15.8?	57.9	40.3	62.3	69.5	64.6	93.0
	4)102											
	25.5											



June 11, 1937.

Beak

	a Length: Length from tip of beak to front of nares	Length from tip of beak to bottom of gape	b Breadth: Breadth of beak at front of nares	Length of nares measured	c Nares to tip: Distance from tip of beak to front of nares	d Height: Height of beak above nares	ba	ca	da	db	dc	Bd
Cherrie 1043	28.8	22.8	13.3	11.2	11.2	17.2	46.2	83.3	59.7			77.4
739	27.5	21.7	13.2		10.8	16.8	48.1	81.9	61.2			78.6
734	27.6	21.7	12.5		10.9	16.7	45.0	87.3	60.2			74.9
19671	26.3	20.6	13.0		10.8	16.5	49.5	83.4	62.7			78.7
321805	29.5	23.5	—		—	—	—		—			
322338	27.4	21.0	12.6		10.9	—	46.0	86.5	—			
19670	27.3	20.9	12.6		11.3	17.3	46.3	89.7	62.3			73.0
420	28.0	21.4	13.6		11.2	17.2	48.6	82.5	61.5			79.1
1220	26.5	20.1	12.4		10.5	17.2	48.3	82.1	64.9			74.5

Beak

a – length of nares
b – width of ditto
c – depth of beak
d – breadth of ditto
e – length

Thamus	a	b	b/a	c	d	e	d/e
231	5.5	2.4	43.7	broken	—	—	?
206	5.0	2.4	48.0	15.8	14.5	23.8	91.8
18478	7.2	2.3	32.0	18.3	15.4	24.9	84.3
18456	6.0	2.2	36.6	15.5	14.0	23.8	90.4
Chelmsay							
322338	6.1	1.5	24.6	17.1	13.1	24.9	76.6
321805	6.7	1.7	25.4	16.8	14.0	26.5?	83.4
420	6.9	1.9	27.5	16.3	~~15.8~~ 13.8	25.3	~~84.7~~ 80.0
736	6.1	2.0	32.8	16.1	13.17	25.7	85.1
19671	6.2	2.0	32.3	15.8	14.3	24.7	90.6
19670	5.6	2.0	35.7	17.0	14.5	24.0	85.3
1043	5.4	1.4	25.9	16.9	14.0	25.8	82.9
739	6.0	1.9	31.7	16.1	13.3	25.3	82.7
Fossil							
E 2004	5.5	2.1	38.2				
E 4805	5.9	2.4	40.7	14.1	13.3	22.5	94.3
E 4485	5.4	2.2	40.7	14.9	15.1	21.5	101.2
E 3488	5.4	2.4	44.5				
K 6028	5.6	1.9	33.9				
F 3158	6.7	2.3	34.4				

32 —— 48

33 — 44

24 —— 35

on a direct line below nares

nares

bw. skins of chewing

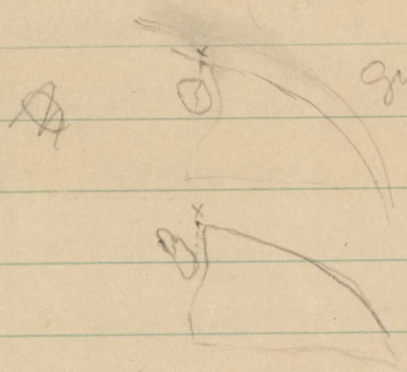
17722 ♂	11.9	13.3	Guatemala	89.6
18 D798 ♂	11.x	13.0	"	87.7
17723 ♂	10.4	11.3	"	92.2
16924	11.8	13.5	S.A.	87.5

Guadelupe — on edge of nares pintail to edge of culmen / on edge of nares pintail to line of cere

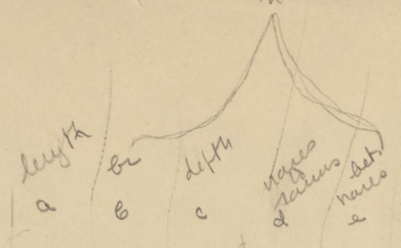
2634 ♀	11.0	14.6	75.4		10.0	14.5	13.4
2633 ♀	10.9	14.3	76.3		9.7	14.2	13.4
2632 ♀	11.1	14.4	77.1		10.1	14.4	13.5

chew.				
11118.3	10.7	12.3	♀ ad?	87.0
15048	11.6	12.5	♀ ad	92.7
15049	10.6	12.0	♂ ad	88.3
16049	11.4	12.3	♂ ad	92.7
12159	11.9	13.3	♀ ad	89.5
6060	10.5	11.9	♀ ad	88.3

(inside meas? as near as possible



Polyborus Beak



in fossil
e is as broad as Thamn
d is shorter than with modern Sp.
dy broad at base ly is in Thamn
nares – more of it ant'ly as in Thamn

	a	b	c	d	e	x	y	y/x ✓	b/a	b/c	c/a	d/a	d/b ✓	d/c	c/a ✓	d/c ✓	x/c	x/d
Thamus																		
736	—	13.6?	15.1?	10.2	5.7	5.6	2.4	42.8	—	90.1?	—	—	75.0?	41.8?	35.8?	37.1?	67.6?	55.0
206	23.8	12.8	15.0	10.2	5.7	5.1	2.5	49.0	53.8	85.3	63.1	42.9	79.8	43.5	38.0	34.0	68.2	56.0
18478	26.9	13.4	16.8	10.5	6.4	7.2	2.5	34.7	49.8	79.7	62.5	39.1	78.5	47.7	38.0	42.8	62.5	68.5
18456	28.8	13.0	15.7	10.4	5.4	5.9	2.4	40.7	54.6	82.9	66.0	42.7	80.1	41.6	34.4	37.6	66.3	52.0	45.4	56.7
Cheniway																		
736	25.7	12.7	15.9	11.0	5.7	6.1	2.3	37.7	49.4	80.0	61.9	42.8	86.7	44.8	35.8	38.3	69.3	51.7	48.0	55.4
739	25.3	13.2	16.1	11.0	5.2	6.1	2.0	32.8	52.3	82.0	63.7	43.5	83.4	39.4	32.2	37.8	68.4	47.3	46.2	55.4
1043	25.8	13.0	16.5	11.3	5.8	5.8	1.7	29.3	50.4	78.8	64.0	43.8	87.0	43.6	35.1	35.2	68.5	51.3	44.6	51.3
32238	24.9	12.7	16.6	11.2	6.6	6.4	2.5	39.1	51.0	76.6	66.7	45.0	88.3	43.1	33.8	38.5	67.5	50.0	50.4	57.1
32180	26.5	—?	—	11.1	5.7	6.6	1.6	24.3	—	—	—	41.9	—	—	—	—	—	51.3	—	59.4
19671	24.4	12.7	15.8	10.9	5.2	6.0	2.0	33.4	52.1	83.1	62.7	44.7	86.0	40.9	34.0	39.2	71.4	47.7	47.3	59.4
19670	24.0	12.7	16.7	11.3	5.7	5.6	2.0	35.8	53.0	76.1	69.6	47.2	89.2	47.9	34.1	33.5	68.7	50.4	44.1	49.6
420	25.3	13.1?	16.3	11.0	5.6	6.4	2.0	31.9	51.8?	80.5?	64.5	43.5	84.0?	42.7?	34.3	39.3	67.6	50.9	48.8	58.2
fossil																		
E4485	21.5	13.3	14.0	8.7	5.4	5.4	2.4	44.5	61.9	95.0	65.2	40.4	65.4	40.6	37.8	38.5	62.1	60.9	40.6	62.1
E4805	22.5	11.6	13.5	7.9	5.3	5.9	2.9	49.2	51.6	86.0	60.0	35.1	68.1?	44.6	39.2	37.8	58.5	67.1	50.8	74.7
E3488		12.3?	13.7?	8.2	—	5.4	2.5	46.3	—	89.8?	—	—	66.6	—	—	39.4?	59.7?	—	43.8?	65.9
K6025		—	14.2?	8.7	5.8	5.3	2.3	43.4	—	—	—	—	—	—	40.7?	37.3?	61.3?	66.7	—	60.9
E2004		—	—	8.8	5.7	5.5	2.4	43.6	—	—	—	—	—	—	—	—	—	64.7	—	62.5
F3158		—	—	—	—	5.8	2.5	43.1	—	—	—	—	—	—	—	—	—	—	—	—
F3159		12.4		8.9									65.3							
Polyborus																		
P. lutosus 19916		13.4		9.2									68.6							

Mr. Frank Stephens
Natural History Museum
San Diego, Calif.

Dr. Clinton G. Abbott
Dana

Cheriwaycoracoid	a length	b cut mid fauna tip (80a)		c depth pit/ cleft	depth pit/ cleft quadrant	ca	cb	ce	cd	ea	eb	
19671	50.5	19.3 ✓	38.2	2.4		12.4	—	47.6				
255	50.5	19.0	37.6	2.3 ✓	5.6	13.1	44.6	49.6	9.4	18.6	49.7	
236	48.8	18.7	38.3 ✓	2.3	5.6	12.3	39.5	47.2	9.4	19.2	50.3	
1220	45.8 ✓	17.3 ✓	37.7	2.4 ✓		12.1	45.7	45.0 ✓	8.6	18.7	49.4	
238	49.3	18.4	37.4	2.4	4.6	13.0	52.3 x	48.7	9.6 ✓	14.3	52.2	47.4 — 52.2 x
1231	48.3	18.2	37.2	2.4		13.2	—	49.7 ✓	8.3 ✓	17.2	45.6 ✓	
239	51.3	19.0	37.2 ✓	2.4	5.5	12.6	48.7	46.8	9.6	18.7	50.5	
32180 s-322338	53.0 ✓ 49.2											
Cutonus Micrai	46.9	17.5	37.3	2.4	5.3	13.7	45.3	51.2	8.9	18.5	49.4	
Thaumatocora.												
18478	55.9 ✓	21.6 ✓	38.6 ✓	3.2 ✓	6.1	14.8	52.5 x	57.3 ✓	9.7 ✓	17.5	47.9	
18456	50.2	20.0+	39.9 ✓	4.1? ✓		20.4	—	81.7 ✓	7.9	17.3	39.5 ✓	
236	49.6	19.5 ✓	39.3	3.7	6.1	18.9	64.7	74.3	8.8	17.7	45.1 ✓	
206	49.3 ✓	19.8	39.6	3.4	5.3	17.4	64.2	69.1	7.9 ✓	16.0	40.5	

decimal should be to left 50 one

Chevinay coracoids left	a length	b tip prox facet	tip bc
19671	51.1	19.3	37.8
355	51.2	18.8	36.7
736	49.2	18.6	37.8
1220	46.3	17.3	37.4
138 left	50.0	18.7	37.4
321805	abnormal		
1231	48.9	18.4	37.6
739	51.9	19.1	36.8
322338	50.3	—	—
lutosus coracoid left 199.6	47.4	17.5 or less	36.9
thurus coracoids left			
18478	57.0	21.9	38.4
18456	51.6	20.3	39.3
236 left	50.2	19.8	39.5
~~236 rt~~	~~49.6~~		
206 left	50.0	19.5	39.0
~~206 rt~~	~~49.3~~		

fossil coralcords	a	b	Ca		cb	ca	c	ca	cb			
E4330 –	50.5'	19.3	38.2									
H4584	46.8	17.7	38.2									
E9837	48.3	19.2	39.8									
E9310	47.1	18.7	39.7									
E4401 –	46.6	17.8 ✓	38.2									
F19	47.6	18.7	39.3									
E4802	45.5'	18.0	39.5'									
E9605' –	50.2	19.3	38.5'									
✓ E4784	47.5'	17.7	37.3									
✓ E9841	48.3	17.9	37.1									
E9865	47.7	18.1	37.9									
	a	b										
nt coralcords		mark	ba		cb	ca		ca	cb			
✓ E6145' –	49.1	18.5'	37.7C	2.6	14.0	53.0	8.6	17.5' ✓	46.5C			
✓ E9629	47.1	18.5'	39.3T	2.8?	15.1T	59.5x	7.9	16.7	42.6			
✓ F4368	46.3	17.5'	37.8C									
✓ E4976	46.8	18.2+	38.2C				6.8	14.5'	37.3 –			
✓ E3823 –	48.0	18.3	38.1C				7.2	15.0	39.3 –	37.3 – 48.1		
✓ H4510	46.1	18.0	39.1T									
✓ H4537	47.3	18.2	38.5'	2.4	13.2C	50.8	7.7	16.3	42.3			
✓ H4547	47.5'	18.2	38.3C	2.9		61.2	7.3	15.3 ✓	40.1			
✓ E4023	47.6	18.1	38.0C	2.9	16.0T	60.4x	8.3	17.4	45.8C			
✓ E929 –	46.6	17.9	38.4	2.8	15.4	60.1x	7.3	15.6	40.7			
✓ H4577	48.1	18.7	38.4	2.7	14.4	50.4	7.9	16.4	42.3			
✓ E9625'	47.6	19.0 ✓	39.9T	2.6d	13.6C	54.2	8.4	17.6	44.2			

fossil coral #1	a	b	ba	c	cb	ca	e	ea	eb
E1157 ✓	47.7	18.8	39.4T	2.8	14.9T	58.6	7.5	16.7	59.9
H4534	47.2	17.8	37.8C	3.0d	16.8T	63.6	7.7	16.3	43.3
✓ H4515	47.8	18.5	38.7T	3.0	16.2T	62.6	8.4	17.5	45.4
✓ H4625	46.4	18.6	39.7T	2.5d	13.4C	53.6	8.2	17.6	44.1
✓ H4554	48.0	18.5	38.5	2.3	12.4C	47.9 ✓	7.2	15.6	40.5
H4548	49.4	18.7	37.9C	2.5d	13.3C	50.6	8.0	16.1	42.7
✓ E4389	47.2	18.9	40.2	3.0d	15.8T	63.2	8.4	17.8	44.4
H4490	49.0	18.9	38.6T	2.5	13.2C	51.1	8.9 ✓	18.5	47.1
✓ E9984	46.1	17.8	38.5	2.8	15.7T	60.7	6.7	14.5	41.4
✓ H4467	46.3	18.5	40.0	2.6d	14.0	56.3	7.5	16.2	40.5
	22) 1014.3		47.4						
	88								
	164								
	154								
	14								
	66								
	104								
	103								

Caracoid latest measr on small sheets attached
+ additions on chart sheet

Size: Right coracoid 43.6–50.0, left 45.0–51.2 (rights are shorter than lefts in the same indiv, noted in all Caracoids).

Characters: As in most of the Dromaeosaurs elements characters used here are tendencies + fossil seems always to fall between Thanns + cheniway in measurements.

① Length — The mean of each side falls slightly above Lutrus, between the min + mean of cheniway and entirely below Thanns.

② The height of the upper part of the bone from the facet to the tip — of 22 specimens measd — 8 fall in the (rel. to length) range of cheniway, 7 with Thanns, Lutrus apes in the cheniway but is below fossil, (Means are let. Ht greater in Thanns

③ the distance of the foramen from the scapular facet — 20 specimens 4 apes in Thanns, 2 fall below Thanns — + all are below Lutrus (dist is rel. greater in cheniway, then Thanns, then Dromaeosaurs, then Thanns then fossil (width unmeasured (scar, 1/20 ④ Depth of head at coracohumeral (scar, 1/20 Thanns; 6 cheniway, Mean intermed. Overlaps Lutrus (cheniway narrower than Thanns, Lut. near (under max. of cheniway.)

Coracoid

Cherinway fossil Thanus

ht approx (to hip) & length
32.8 – 33.8
31.4 – 33.9
29.7 – 31.4

20.2 – 21.1
ht. approx. (to facet) & length
18.8 – 21.0
17.6 – 19.2

63.5 – 61.1
Gr. prox. to ht. approx (to hip)
67.6 – 61.0
69.3 – 64.5

length at inner ∠ to length at outer ∠
fossil
91.9 – 90.6
92.7 – 92.3 92.1 – 91.3

ht prox. (below facet & hip) & length

left
36.4 lat. Thanus
36.8 – 37.8 38.4 – 39.1
cher. 37.1 – 39.8
fossil

rt
lat. 37.3 Thanus
37.2 – 38.3 38.6 – 39.9
cher. 37.7 – 39.3
fossil

depth head top part & ht.
13.7
12.1 – 13.9 14.8 – 20.4
rt 12.4 16.6

& length
51.2
47.6 – 53.3 57.3 – 81.7
50.4 60.9

ratio dist & for. & length
18.5 lat.
17.2 – 19.5 cherinway
16.0 17.7 Thanus
rt 14.5 – 18.5 fossil

rel & ht of upper part
49.6 lat
43.4 – 52.2 cherinway
39.5 45.4 Thanus
rt 31.3 – 48.1

ht above facet rel. & length greater in Thanus than cherinway fossil tying the two together by overlap. Lutosus falls below fossil.

.6
.7
.4
.5
.7
.6
.6
1.1

1.1
1.4
.6
.7

.5

Oracoid

	length										
	a	b post end	c max end	ba	ca	d	da	c last max end	ca		
Thamnophis											
236	~~49.5~~ 500	11.1	17.0	22.4	34.4	19.4	39.2	17.0	34.4	11.4	22.8
206	49.6	10.6	17.0	21.3	34.2	19.6	39.5	16.5	33.2	11.0	22.1
18478	~~55.9~~ 56.8	11.5	18.8	20.6	33.6	21.2	38.4	18.8	33.6	12.0	21.1
18456	51.0	10.8	17.3	21.2	33.9	20.2	39.6	17.3	33.9		
chersinus											
19671	50.8	—	16.5	—	32.5	19.3	38.0	15.3	30.2	10.1	19.9
739	51.6	10.6	16.4	20.6	31.9	19.2	37.3	16.7	31.4	10.6	20.5
35?	50.6	10.0	15.2	19.7	30.1	18.8	37.2	15.1	29.8	9.1	17.9
736	48.7	9.9	15.1	20.3	31.0	18.7	37.8	15.0	30.4		
737	49.1	10.1	15.8	20.4	32.0	18.8	38.0	15.1	30.8	9.9	19.8
32233	49.8	11.2?	15.6?	22.4	31.2	18.5	37.2				
32180	52.3	11.1	16.7?	21.3	32.0	19.6	37.5				
fossil											
E9629	47.2	10.5	15.2		32.4	18.3	39.0	14.8	31.7		
E3017	45.1		14.9		33.1	17.7	39.3	14.8	32.8		
E960	50.0		16.6		33.2	19.8	38.8	16.4	32.8		
E984	44.3		14.9		33.7	17.6	39.8	14.4	32.6		
E9837	47.9		16.8		33.4	18.5	38.6	15.8	32.9		
E1300	47.2		16.0		33	18.7	39.6	15.7	33.2		
E1346	46.8		15.4		32.9	18.4	39.3	—	—		
F 24	47.2							15.3	32.4		
E4784	47.0							15.5	33.0		
E457	47.6							15.9	33.4		
H4536	46.2							15.1	32.8		
E4330	50.1							16.1	32.2	10.4	

Right coracoid

additional 6 catch extremes

100 specimens checked

	a	6	c	d	ba	ca	da	db		a	6	c	d	ba	ca	da	db
	length	part length	least depth head	dist foramen pneumat													
H4576	48.9	18.4	3.0	7.2	37.6	6.1	14.7	39.2	H4483	45.7	17.5		8.6	38.2			49.1
H4491	47.6	18.1	3.3	7.7	38.1	6.9			E2536		18.2		8.0	—			43.9
H4591	46.8	18.4	2.8	7.3	39.3	5.9			H4485	48.6	18.4	2.8	7.1	37.8	5.7		38.5
F14	47.0	18.5	2.5	7.2	39.4	5.3			E4621	46.7	18.0		6.6	38.5			36.6
H4599	48.7	18.8	2.7	8.5	38.6	5.5	17.4	45.2	E2024	—	17.2		6.4	—			37.1
E4456	48.9	18.5	3.2	8.5	37.8	6.4		45.8	H4563		17.9		6.7	—			37.4
E4777	49.9	18.5	2.9	7.7	46.2	6.45		41.6	E2581	46.2	16.3	2.2	7.9	36.6	4.7		47.8
H4472		18.2		8.2				42.8	H4570	45.1	17.0	2.7	7.0	37.8	5.9		41.2
H4477	46.4	18.5	2.6	7.8	39.8	5.6	16.7	42.2	H4548		18.4	2.7	7.5	—			33.6
E9786	46.9	18.8	2.8	7.3	40.2	5.9		38.8	H4619	46.8		3.2	6.	—	6.8		
E9288	—	17.8	2.7	7.0	—			40.0	H4474	48.5		2.8		37.3	5.7		
E4389	47.3	18.8			39.8	6					18.9		7.8	37.8			41.3
H4560	47.6	17.8	2.7	7.4	38.3	3.7		41.6	E1983	44.3	17.2			38.4			
H4593	45.0	17.6	2.4	7.5	39.1	6.2	16.6	42.6	H4603	49.4		3.5		—	7.0		
E9308	46.3	17.3	2.3	7.7	37.4	4.97	16.6	44.5	H4490	44.0	18.8		8.9	38.4			42.4
E2604	46.8		2.9			6.1						2.0					
H4487	47.4	18.7	3.2	6.7	37.5	6.7	14.1	35.8									
E6455	49.1	18.6	3.0	8.1													
E4369	45.6	18.1	2.8	7.0	39.1	6.1		38.6									
H4697	47.8	18.4	2.9	7.3	38.5	6.0		39.7									
H4531	47.2	17.7	3.2	7.8	37.5	6.8											

2.0 sweal not taken because didn't note that 2.0 was not already recorded as minimum

30 of 44 = filaments

	length a	dist tip to pmx	dist pmx to facet	Gr a pmx	~~ab~~	? cd	ant da	T- ba	T- ca	C- db	dist tip to c	ae	lat pmx part to tip	fa
Thanus														
236	49.7	16.8	10.5	11.7	62.0%	94.6	22.3	33.8	21.1	61.1	55.1	92	19.8	39.8
18478	52.0	18.7	11.5	11.5	61.5	100.0	20.2	32.8	20.2	61.5	62.5	91.3	22.9	40.3
206	50.2	16.4	10.7	10.4	65.4	103.0	20.7	32.8	20.4	63.5	54.5	92.1	19.6	39.1
18456	51.7	17.2	11.5	10.7	66.9	107.5	20.7	33.2	20.7	62.3	56.7	91.4	20.3	39.3
lutosus 19916	47.5												17.8	39.5
cheriway														
736	49.3	15.1	9.1	10.0	60.3	91.0	20.3	30.7	18.4	66.3	53.2	92.7	18.4	37.4
739	52.0	16.3	10.0	10.5	61.4	95.3	20.2	31.4	19.2	64.5	56.2	92.6	19.2	36.9
738	?49.4	15.4	9.0	10.0	58.4	90.0	20.2	31.2	18.2	65.0			18.5	37.5
355	51.2	15.2	9.0	10.0	59.2	90.0	19.5	29.7	17.6	65.8	55.5	92.3	18.8	36.8
19671	51.2	15.6	9.8	~~10.8~~?	62.8	90.6	21.1	30.5	19.1	69.3	55.5	92.3	19.3	37.7
1231	48.9	—	—	—									18.3	37.4
1220	46.3	—	—	—									17.3	37.4
E9629	47.1	15.3	9.6	10.2	62.7	94.1	21.6	32.4	20.3	66.7	52.2	90.6	18.3	
E4784	47.6	15.9	9.7	9.7	61.0	100.0	20.4	33.5	20.4	61.0			18.6	
E4830	50.6	16.3	10.2	10.5	62.6	97.4	20.8	32.2	20.2	64.5			19.3	
E9841	48.4	15.2	9.2	10.1	60.5	91.1	20.9	31.4	19.0	66.5				
E4802	45.6	15.0	9.5	9.3	63.4	102.1	20.4	32.9	20.8	62.0	49.6	91.9	18.1	
F645	49.2	15.7	10.3	10.6	65.6	97.3	21.4	32.0	21.0	67.6	53.7	91.5	18.5	
F19	47.7	15.9	9.5	10.0	62.9	95.0	20.9	31.6	19.9	66.3				
E9837	48.4	16.2	9.8	10.4	60.5	94.1	21.5	33.4	20.2	64.3	53.0	91.4	19.2	
E4605	50.2	17.0	10.2	10.7	60.1	95.5	21.4	33.9	20.4	63.0				
E4401	46.7	15.0	8.9	9.5	58.6	92.6	20.3	32.1	18.8	63.3	51.2	91.6		
E4368	46.3												17.1	37.0
H4584	46.3												17.7	38.3
E9310	47.1												18.7	38.9

a length to inner angle
b lat of pmx. portion to tip
c " " " edge of facet
d br of pmx. end
e length to outer angle

The lat of the pmx. part in the ~~Thanus~~ cheriways is interned. Last towards Thanus ~~The distance length from tip to the edge of the~~

Caracid

E9841	48.4	17.8	36.4
E9865	47.7	18.0	37.7
H4490	44.0	18.8	37.7

median = 47.6

6(Sept Coracoid Fossil Polyborus

43	44	45	46	47	48	49	50	51
43.6		45.5	46.3	47.1	48.3	49.0	50.5	51.2
		45.0	46.6	47.6	48.3	49.4	50.2	
		45.9	46.7	47.5	48.4	49.3	50.4	
		45.7	46.9	~~47.7~~	48.9	49.2		
			46.9	~~47.7~~	48.5	49.4		
			46.7	~~47.9~~	48.6	49.7		
			46.3	47.6	48.7	49.0		
			46.6	47.3	48.9			
			46.4	47.4	48.8			
			46.5	~~47.7~~	48.3			
			46.8	47.6	48.7			
			46.9	47.6 47.6	48.1			
			46.5	47.4 47.6	48.0			
			46.5	47.3 47.7				
				~~47.8~~ 47.7				
				47.2 47.7				
				47.5 47.8				
				47.0 47.9				

23 / 31 / 23 / 69 / 3 / 71 20

31 / 4 / 125 / 20 / 145 / 23 / 68

~~Median~~ = Autosomes 47.3

Right Sacroiliac Polyboms

43	44	45	46	47	48	49	50
43.6	44.9	~~45.2~~	~~46.8~~	~~47.2~~ 47.6	~~48.9~~	~~49.5~~	50.0
	44.2	~~45.8~~	~~46.4~~	47.6	49.0 ~~48.0~~	~~49.2~~	50.0
	44.3	~~45.8~~	~~46.3~~	~~47.9~~ 47.0	~~48.8~~	~~49.3~~	
	44.3	~~45.1~~	~~46.1~~	~~47.7~~ 47.1	~~48.1~~	~~49.2~~	
		~~45.3~~	~~46.5~~	~~47.8~~ 47.2	~~48.7~~	~~49.0~~	
	44.9						
	47.4	~~45.3~~	~~46.9~~	~~47.8~~ 47.2	~~48.7~~	49.7	
		~~45.8~~	~~46.8~~	~~47.6~~ 47.2	~~48.4~~		
		~~45.1~~	~~46.1~~	~~47.2~~ 47.3	~~48.2~~	49.1	
		~~45.5~~	~~46.5~~	~~47.3~~ 47.3	~~48.0~~		
		~~45.0~~	~~46.6~~	~~47.5~~ 47.3	48.9		
		~~45.0~~	~~46.8~~	~~47.3~~			
		45.0	~~46.2~~	~~47.4~~			
			46.9	~~47.9~~			
	38		~~46.2~~	~~47.4~~			
			~~46.1~~	~~47.6~~			
			46.6	~~47.9~~			
			46.5	~~47.4~~			
			46.3	~~47.5~~			
				~~47.5~~			
			46.9	~~47.6~~			
				~~47.6~~			
				~~47.0~~ ✓			
				47.3 ✓			
				~~47.2~~			
				~~47.0~~ ✓			
				~~47.8~~			
				~~47.6~~			
				~~47.6~~			
				~~47.0~~ ✓			
				~~47.6~~			
				~~47.1~~ ✓			
				~~47.2~~ ✓ 47.8, 47.0, 47.2			

Right Caucasoid

43	44	45	46	47	48	49	50	51
43.6	44.9	45.2	46.8	47.2	48.4	49.5	50	
	44.2	45.38	46.4	47.6	48.0	49.2	50	
	44.3	45.8	46.3	47.9	48.8	49.3		
	44.3	45.5	46.1	47.7	48.5	49.2		
	44.9	45.3	46.5	47.7	48.7			
	44.4	45.3	46.9	47.8	48.7	49.0		
		45.8	46.8	47.8		49.1		
		45.1	46.1	47.2	48.6			
		45.5	46.3	47.3	48.2			
		45.0	46.6	47.8	48.0			
		45.0	46.8	47.5	48.9			
		45.0		47.3				
			46.2	47.4				
			46.9	47.4				
			46.2	47.6				
			46.1	47.9				
			46.6	47.4				
			46.5	47.5				
			46.3	47.6				
			.6	47.6				
				47.0				
				47.3				
				47.4				
				47.8				
				47.4				
				47.0				
				47.6				
				47.1				
				47.2				
				47.0				
				47.8				
				47.5				

47.0
47.0
47.0
47.0
47.1
47.2
47.2
47.2

NT Caucasoid Chemical assay

53.0
49.2
50.5
51.3
48.8 —
45.8
49.3
50.5
48.3

49.6
48.3
50.2
55.9

9) 446.7 (49.6
36
86
81
57

4) 205.0 (51.2
20
10

Layton analyzed in series

Scapula - Polybrachia

	a greatest breadth prox.	c Gr. glenoid	d	fr	ca	a acromion to mid.	da	de	delt. acrom.		
E4089	14.7	4.4	6.4	69.0%	43.5'	6.5'	3.4	44.2	52.3	9.8	66.4
H6501	14.9	4.8	6.6	72.2%	44.3					10.1	
H6686	15.6	4.8	6.5'	73.8%	41.7	6.6'	3.2	42.3	49.5'	10.3	
F1335'	15.1	—				6.5	3.3	43.0	53.8	10.0?	64.2
N6499	14.1'	—									
C8659	15.1?	4.8	6.5'	73.8%	43.0					10.2	
C8670	15.2	4.7	6.6	71.2	43.4	6.1	3.8	—	—	10.0	65.8
H6672	15.4	4.7	7.0	67.3	45.4	—	—	—	—	10.4	
H6674	15.2	4.4	7.0	62.8	46.1	6.5'	3.8	42.0	—	10.2	
H6745'	15.2	4.8	6.9	69.6	45.4	6.5'	—	42.7	51.1	10.1	66.5
Thamo											
18456	16.4	5.4	7.3	74.0	44.5'	6.9	4.0	42.1	58.0	6.9	11.0	67.2
236	16.2	5.6	7.1	78.8	43.8	7.0	3.8	43.2	53.3		11.2	
18478	17.0	6.0	7.2	83.4	42.3	7.7	4.2	45.2	54.1		11.3	
206	16.3	4.8	7.1	67.6	43.5'	6.7	3.7	41.1	55.3	6.2	11.1	
Cheiruc												
736	14.8					5.6			51.1		9.8	66.3
738	15.0										10.5	
739	15.4										10.3	67.0
355	15.6										10.5	

April 9, 1937

Humerus

(1)

Size: 100.3 – 115.3 mm. – median is 109.7. Considerably smaller than Thanet, but about as in cheriway. Lutosa falls toward the small side of the median (just, mm.)

Characters: Proximal end – the outline of the bicipital crest is a broad, well-rounded curve with its outermost point usually distal of the mid-point of the curve (mid-point as measured from the ligamental furrow to the intermuscular line bordering the bicip. surface distally). (Except in 102 in dris.) This outermost point is not distinctly marked as it is in cheriway. In cheriway the outline of the crest is a rounded angle with the apex slightly proximal of the mid-point, ~~with~~ The portion distal to the apex is nearly straight. ~~This apical point~~ The apex is clearly demarcated in cheriway, particularly if the bone is rotated slightly so that the edge is viewed in a half palmar, half internal aspect.

As the apical point coincides approximately with attachment of the infrasphinatus, it. The bicipcrest extends below the intermuscular line.

In Thanet the outline is a broad, well-rounded curve like the fossil. The outermost point is very low and is not easily demarcated. Crest usually ending at the intermuscular line, tho a very slight extension beyond it one.

Lutosa is similar to Thanet tho with an even lower "apex" (lower than fossil). Slight extension of crest beyond intermuscular line, Apex not demarcated.

4/9/37

Proximal end of humerus continued —

(2) Pneumatic fossa at a noticeably different level than the bicip. crest, with a step from one to the other in most of the fossils. In a few specimens, however there is a more gradual slope, Specimen no. 236 of Rhamus is closest to the fossil in this character, but others of Rhamus are less so, hilutosus. The fossa opens from a large pneumatic foramen, with floor depressed almost to the level of the bicip. crest. This cond. is not duplicated in the fossil specimens.

Note

Distal end; (3) In general ectepicondylar prominence more smoothly rounded & less conspicuous in Sherriway than in hilutosus, Rhamus or the fossil.

Humerus

In general these characters are true

Proximal end

Ext epicondylar prominence more smoothly rounded in cherriway than in lutosus or Thamus. (less conspicuous)

fossil like the two " "

Prox. end

(1) Pneumatic fossa "steps" back to bicipital crest in most fossils This in a few specimens the slope is gradual. No. 230 thamus is closest to fossil but other Thamus & lutosus are dif. in this regard

lutosus particularly The fossa opens from a large pneumatic foramen with floor depressed almost to level with the crest. This exact cond. is not found in any fossil spec.

(2) Size of pneumatic foramen — distally edges stop at prox to 2nd papilla on med. front

(3) Shape of bicipital crest

Broadly rounded especially below the center in front

Cherriway slanting in rather straight from outermost point far above center - giving feeling of a def. pt at which crest slants (more angular than fossil (a sort angle)) (lutosus)

Thamus lutosus nearer fossil but all in Thamus

have short crest while in fossil they vary from short to as long as cherriway.

Even some which look short in that they bulge out as described, extend a bit above the intermuscular line bicipital surface - as in cherriway.

Humerus

	Gr. Tub.	Gr. Line
E 596	9.6	8.7
9852	9.6	8.4
3524	8.5	7.9
4354	9.3	8.4
3927	9.1	8.2
1902	8.8	8.1
234	8.8	8.2

clavicle

803	8.8 - 8.5
321805	9.1 - 8.9
1043	8.7 - 8.5

Opossum

Humerus

Character of bicipital crest-

fossil

Outline of crest- in fossil - abroad well-rounded curve - with point a bit distal of the center (usually) - (center as measured from ~~bone~~ bicip. fossa to intermuscular line bordering bicip. supary distally. Apex (or ectepicondylar process) marked as in cheriway (except in 2 indivs) crest in some extends below bordering line in Thamus, slightly turned upward to general surface of humerus, but not distinctly modified as in cheriway.

Outline of crest a rounded angle in cheriway - The apex being slightly proximad to center with portion distal to center nearly straight. This apical point is clearly demarcated parallarly if bone is rotated slightly to see the edge in half palmar - half internal aspect. crest always extends below bordering line of bicip. supa.

because coincides with attachment of supinator

cheriway

Thamus { Broad well - rounded curve with "apex very low. Crest usually ending at bordering line The very slight extension beyond is one, apex not easily demarcated

Lutons (~~same as~~ Thamus however - Low apex ~~not~~ turning in to shaft less smoothly. Very slight extension crest beyond line, apex not demarcated as in cheriway.

Humeurs - fossil Caracara

	a length	b dist	16.3–17.4 6a	c fmx	19.2–20.4 ca	79.6–83.9 bz
E1327	115.4	19.0	16.4	22.8	19.7	85.4
9852	114.3	19.6	17.1	23.2	20.3	84.6
1318	114.0	19.3	16.9	22.6	19.7	82.9
3526	112.4	18.4	16.3	21.4	19.2	83.3
9398	112.4	18.9	16.8	22.4	19.9	84.1
4356	112.1	19.0	16.9			
9561	112.1	18.4	16.4			
877	112.0	18.8	16.8			
left 3864	111.6	19.0	17.0	22.3	20.0	85.3
3927	110.7	18.4	16.6	22.4	20.2	82.2
9847	110.4	18.5	16.7			
1441	110.2	18.4	16.7	22.3	20.2	82.6
9994	109.2	18.6	17.0			
588	109.0	19.0	17.4			
~~4795~~	~~109.0~~					
2511	109.0	18.5	16.9	22.4	20.5	82.6
left 3490	107.8	18.7	17.3			
left E1518	106.9	18.2	17.0			
" 596	105.9	18.1	17.1	21.5	20.3	84.3
" 597	105.7	18.0	17.0			
2552	104.2	17.1	16.4	21.1	20.6	79.6

20) 2205 3 37 2.1 20) 336 90 16.8 #) 220.6 20.0 200

186 110.20 20 172 160 12 20 336 320 16 20 1.1

Hemeus – Canada – Modern

	a length	b dist	ba	c prop	ca	bc
Cheriwa						
.7397	115.0	17.8	15.5	22.6	19.6	78.8
3218054	115.0	18.7	16.2	23.2	20.1	80.7
1043	114.7	18.3	15.9	22.7	19.8	80.7
1967.007	114.1	18.2	15.9	22.8	19.7	81.0
1967.6	113.8	18.4	16.1	22.7	19.9	81.1
8037	111.7	17.3	15.0	21.4	19.1	80.9
7387	110.6	17.6	15.9	22.0	19.9	80.1
3223387	109.3	17.9	16.2	22.0	19.9	81.5
355	108.1	17.3	16.0	21.8	20.1	79.4
236	107.9	17.5	16.2	22.0	20.4	79.5
1220	104.2	17.4	16.7	20.9	20.0	83.3
			11) 176.1 (16.0		11) 219.5 19.8	
Thames			16.1–17.3			78.4–82.1
18478	128.0	20.6	16.1	25.3	19.7	81.6
18456	116.3	19.6	16.8	24.4	20.9	80.4
206	115.7	20.0	17.3	24.3	21.0	82.4
236	115.0	18.5	16.1	23.6	20.5	78.4
			9) 66.3 16.5		4) 82.1 20.5	
Lutoma	108.4	18.5	17.0	22.3	20.5	83.0

104 / 99 / 4

July 22, 1937

Humerus contd for extremes

	prox	dist	length
3264	20.5	17.7	100.3
E2614	21.6	17.0	104.3
E1902	20.8	19.8	102.0

palmar side of area connecting

area preceding distally from ectepicondyle on palmar side slightly swelled ~~with parallel~~ & area adjacent & emphasized also by above ext. condyle slightly depressed

area between ~~ect~~ condyl & ect-epicondyle

area above ext. condyle on palmar side depressed & bordered externally by a ~~ridge~~ ~~line~~ ~~deadstraight~~ swelling extending down from the epicondyle. ~~Swelling particularly acutely developed near the~~ Swelling forming ~~small~~ ~~acute~~ tubercle - ~~ridge~~ near epicondyle.

~~ridge~~ ~~ended~~ & sharpened into ~~small~~ tubercle - short ridge near epicondyll

cheriway fossil Thanes

13.2 — 14.2 Tha

by prox — 12.5 — 13.45 F ①
length — 12.3 — 12.9 C

C 12.9 — 13.8
by prox — 12.2 — 12.9
g. length — 12.1 — 12.7 ①

6.8-7.1
by condyle — 6.7 — 7.7 ②
length — 6.5 — 6.9

7.4 — 8.0
by cond. — 7.5 — 8.37 ②
depth cond. — 7.43 — 7.97

82.6 — 96.7
by dist — 82.7 — 97.1 ②
length — 85.1 — 96.5

dist

bicip. tub. prox. length
13.6
12.8 — 13.7 Thanes
11.9 — 12.9 cheri
12.3 — 13.4 fossil

prox dist
(113.3, 113.1) 12.6 9.7

ulna

Disregarding sexes male individuals)

① Rel. Br. prox and intermed. det. cheriway + Thanes, overlapping of Th

② Rel, Br dist and absent btw Thanes + overlapping cheriway (as does Thanes)

	Thanus	cherinay	Jasmil
b/a	13.2 – 14.2	12.3 – 12.9	11.6^{C-} – 13.45^{T}
b/c	12.98 – 13.87	12.05 – 12.7	11.3^{C-} – 13.15^{T}
d/a	6.84 – 7.5	6.57 – 6.95	6.8^{C-} – 7.27^{T}
d/e	7.4 – 8.0	7.4 – 7.9	7.28^{C-} – 7.8^{C-T}
d/f	8.23 – 8.57	8.28 – 8.73	8.03^{C-} – 8.92^{T+}
a/e	8.76 – 9.67	8.51 – 9.15	8.08^{C-} – 9.71^{T+}
length	119 ✓ 132.2 ✓	112.2 – 122.9	$114\frac{1}{2}.8$ – 119.2

	b/a	b/c	d/a	d/e	d/f	ae	
E4765	T	T	TnC	TnC	TnC	TnC	117.1
E1411	T-	C+	T	TnC	C	T+	115.4
E810	T	T	TnC	TnC	TnC	TnC	114.8
E3684	C	C	C	TnC	—	TnC	117.3
E3200	C	C	C	TnC	TnC	TnC	118.3
E1313	C	C	T	TnC	C+	TnC	117.4
E1512	-C	-C	-C	TnC	TnC	-C	115.7
E778	-C	-C	C	-	T-(nC?)	TnC	116.9
D160	C	C	C	TnC	TnC	C+	119.2

also

Plants area	a length Stalk	b width	ba	Spur length	ca	b/a distr.		
236	119.7	12.8	10.7	15.8	13.2			
206	122.8	13.6	11.0	16.2	13.2			
1847 78	132.7	14.0	10.5	17.0	12.8			
1845.6	121.7	13.8	11.3	16.7	13.7			
lutosus	113.1	12.5	11.0	15.4	13.6	110.7 10.3	93.	
cheiroy								
1043	122.4	12.3	10.0	14.9	12.1			
1220	109.0	11.8	10.8	14.1	12.9			
739	121.3	12.2	10.0	14.8	11.9			
720	112.4	11.7	10.4	13.8	12.2			
738	118.6	11.6	9.7	14.2	11.9			

13.6
12.8 — 13.7

11.9 — 12.9

12.3 — 13.4

fossil ulna	length	~~C~~ pox	Cw
E35'49	115.7	14.3	12.3
E3367	111.5	13.7 ?	123
F90'5	115.8	14.6	12.6
E15'83	118.7	14.8	12.4
E1328	119.1	14.7	12.3
E1311	114.3	14.2	12.4
E25'62	112.4		
D160	119.0	14.7	12.3
E91'5	119.1		
E121Y	112.2	14.3?	12.7
E39'58	113.1	15.2	13.4
E39'53	121.7	16.3	13.4
E36X4	117.3		
E55'15	118.8	15.8	13.3
E1339	122.0	15.4	12.7
E4834	117.0	14.7	12.5

e – breadth of dist. end
f – depth of dist. end

Ulna

a – length from carpal tuberosity
b – breadth of prox. end
c – greatest length
d – breadth of condyle

Flares	a	b	b/a	c	a/c	b/c	d	e	f	e/a	f/a	a/c
286	117	15.9	13.6	119.9	97.7	13.26	8.4	11.3	10.1	7.18	.744	832	89.5	86.4	967
18478	130	17.2	13.2	132.7	98.2	12.98	8.9	12.0	10.5	6.84	.742	847	87.7	80.6	924
206	120	16.4	13.7	123	97.7	13.33	8.4	10.5	10.2	7.0	.800	823	97.3	85.2	876
18456	119	16.9	14.2	121.9	97.8	13.87	8.9	11.8	10.4	7.5	.787	857	92.2	87.5	950
Cherioway															
1043	120	15.1	12.6	122.9	97.8	12.3	8.2	10.4	9.5	6.83	.788	863	91.4	79.2	868
736	113.3	14.5	12.8	115.8	98.1	12.5	7.8	10.0	9.4	6.9	.788	830	94.0	93.0	885
739	118.9	14.7	12.4	121.5	97.9	12.1	7.8	10.1	9.3	6.57	.787	829	92.2	79.3	851
738	116.3	14.3	12.3	118.7	99.9	12.05	7.8	9.9	9.4	6.7	.772	830		80.6	851
420	110.4	14.1	12.8	112.7	98.1	12.5	7.5	10.1	8.8	6.8	.743	852		79.9	915
19671	118.1	15.3	12.9	120.4	98.3	12.7	8.2	10.3	9.4	6.95	.797	873		79.5	873
Fossil															
E3684	114.7	14.6	12.7	117.3	97.8	12.45	7.7	10.1	9.6	6.71	.763	803	95.1	83.8	882
E4765	114.6	15.2	13.3	117.1	97.8	12.99	7.9	10.2	9.4	6.9	.775	840	92.1	82.2	893
E3200	115.8	14.4	12.45	118.2	98.1	12.2	7.8	10.4	9.3	6.75	.750	837	89.2	X 0.3	899
E1313	114.4	14.8	12.9	117.6	97.5	12.6	8.3	10.7	9.3	7.25	.775	892		81.3	936
E1411	112.7	14.8	13.1	115.4	97.8	12.75	8.2	10.6	9.5	7.37	.773	863		84.4	971
E1512	112.6	13.1	11.6	115.7	97.5	11.3	7.1	9.1	8.3	6.3	.780	855	f	73.4	808
E778	114.3	13.5	11.8	116.9	97.9	11.55	7.5	10.3	9.1	6.55	.728	825		79.4	903
D160	116.5	14.9	12.8	119.3	97.7	12.5	7.8	10.2	9.1	6.7	.765	857		78.2	877
E810	112.3	15.1	13.45	114.8	97.9	13.15	7.7	10.1	9.2	6.85	.762	837		81.7	900
E1339	118.9	15.6	13.1	122.3	97.3	12.76	8.2	10.4	9.5	6.8	.788	882			876
E3367	109.1	13.8	12.5	112.5	97.2	12.29	7.9	9.7	9.1	7.28	.814	869			888
E1037	109.4	13.7	12.5	112.1	97.6	13.33	8.1	10.4	8.8	7.38	.777	920			948
E1553	110.0	14.1	12.8	112.3	98.1	12.57	8.2	9.8	9.3	7.45	.837	881			891
E1218	109.8	14.4	13.1	112.1	98.0	12.85	8.5	10.4	9.3	7.75	.807	914			956

June 30, 1937

ulna

3c 13/49 Ja Brea fossil	a	b Gr prox	c prox. diag length	d Gr dist	e Gr trochl	6 depth trochl	9 depth prox	X Gr sh	depth sh	da	ca	ea	xa	ya
E1328	119.1	12.4	14.7	10.3	7.9	9.3	11.3	5.8	6.1	86.5	12.3	6.6	4.8	
D160	119.1	12.8	14.7	9.8	7.9	–	11.1	6.1	7.0	82.2	12.3	6.6	5.1	
E2562	112.4	12.5	—	9.9	8.2	9.1	11.1	5.3	6.1	88.0	—	7.2	4.7	
E1339	122.1	13.0	15.5	10.1	7.9	9.5	11.4	5.9	6.6	82.7	12.7	6.4	4.8	
E3515	118.8	13.0	15.7	10.5	8.2	9.6	12.0	5.7	6.3	88.5	13.2	6.9	4.8	
E905	115.8	12.3	14.5	—	—	9.2	11.2	6.0	6.7	—	12.5	—	5.1	
E3958	113.2	12.3	15.0	9.3	7.8	9.3	11.4	5.4	6.1	82.2	13.2	6.9	4.7	
E1311	114.4	12.3	14.1	9.9	8.4	8.6	10.8	5.6	6.4	86.4	12.3	6.4	4.9	
E3589	115.7	12.1	14.3	9.2	7.7	9.3	11.0	5.7	6.3	79.4	12.3	6.4	4.9	
E4837	117.0	12.7	14.7	9.9	8.2	9.5	11.0	6.0	7.0	84.6	12.5	7.0	5.1	
E3367	111.6	11.5	—	9.2	7.7	9.0	10.4	5.5	6.2	82.5	—	6.9	4.9	
E3953	121.7	13.4	16.3	10.4	8.7	10.2	12.1	6.1	7.1	85.7	13.4	7.1	5.0	
E495	117.1		14.95		11.87			5.7			12.67	7.46	4.8	
E787	114.7				10.7			5.6				6.8	4.8	
E837	112.5				9.9			5.0					4.4	
E4648	116.8							5.5					4.7	
E998	115.2							5.6					4.8	
E1587	116.6							6.0					5.0	
E810	114.7							5.5					4.8	
999	116.4							5.5					4.7	
E617	122.1							5.6					4.5	

21) 116.6 / 4.99 / 21 24 39 21 / 13 9 20 / 13 4

21) 119.7 (5.7) / 143 / 141

4 / 21) 101.3 / 84 / 173

Ulna - Rusa caucasica

	a length	b prox br	c prox. diag length	d dist br	e trochl br	f dist. trochl depth	g prox depth	da	x br sh	y depth sh	ea	xa	ya	xy	ca
Chertsey															
420	112.5	11.7	13.9	10.0	7.3	8.7	10.4	89.0	4.9	5.6	6.5	4.3	4.9	89.5	12.6
736	115.7	12.1	14.4	10.2	8.0	9.2	10.7	88.4	5.0	6.2	6.8	4.3	5.3	80.6	12.4
1220	109.0	11.8	14.1	9.7	7.5	9.0	10.4	89.0	4.8	5.7	6.6	4.4	5.2	83.3	12.9
739	121.6	12.1	14.6	10.0	8.0	9.2	11.1	82.4	5.1	6.3	6.5	4.2	5.3	98.6	12.0
1043	122.5	12.3	14.9	10.6	8.2	9.5	11.1	85.6	5.2	6.2	6.7	4.2		83.9	12.1
738	118.7	11.8	14.2	10.10	7.9	9.1	10.7	84.5	5.2	6.2	6.6	4.3		83.9	11.9
Thanet 18470	132.4	13.7	16.6	11.9	8.7	10.5	12.4	89.9	6.3	6.9	6.5	4.7	5.2	91.3	12.5
236	120.1	12.9	15.6	11.1	8.6	10.0	11.7	92.4	5.8	6.5	7.1	4.8		89.3	12.9
206	123.0	13.9	16.2	10.6	8.6	10.1	12.0	86.3	5.7	6.3	7.0	4.6		90.5	13.1
1845'6	121.8	14.0	16.7	11.4	9.1	10.3	12.5	73.7	6.3	7.1	7.4	5.1		85.7	13.7
Eutopus	113.1	12.4	15.5	10.0	7.7	9.3	11.7	88.5	5.7	6.5	6.4	5.0			

52) 6033.1 (116.0

109.9 = acad.

Ulna total 50 + acad 2 = 52

112 113 114 115 116 117 118 119 120 121 122

112.3 113.1 114.1 115.8 116.5 117.1 118.6 119.7 120.1 121.6 122

112.7 113.8 114.4 115.9 116.0 117.4 118.7 119.2 120.0 122.3

112.1 113.6 114.7 115.7 116.6 117.1 118.7 238.9 240.1 244.5

112.3 113.7 114.4 115.5 116.4 117.0 118.8 121.6

112.4 113.8 457.6 115.7 116.9 116.6 173 118.8 240.1

112.2 568.0 578.4 116.4 116.7 117.5 593.4 938.4

112.6 116.7 116.9 117.0 932.4 578.6

(112.1 acad.) 4982 116.9 116.9 117.5 936.4 568.0

932.4 848.2

111.5

109.9

6033.1

47.4

68 + acad = 69

Humerus

100.1 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115

100.3 102.0 104.3 105.2 106.9 107.6 108.0 ✓109.1 110.1 111.1 112.1 113.9 114.7 115.3

104.6 105.6 106.6 107.8 108.6 ✓109.1 110.7 111.6 112.2 113.7 114.3 115.2

104.8 105.9 106.8 107.2 108.8 ✓109.6 110.3 111.1 112.9 113.0

104.0 105.9 106.1 107.2 3254 109.9 110.6 111.5 112.0 240.1 229.0 230.5

417.7 105.1 426.4 107.8 ✓109.0 110.5 111.8 112.4

105.2 107.X 645.4 ✓109.1 110.4 557.1 112.0

Acad 105.8 ✓109.2 110.2 112.4

738.7 ✓109.0 110.3 112.1

✓109.8 110.8 898.1

✓109.6 110.7

✓109.4 110.2

1202.8 110.0

1324.8

100.3

102.0

417.7

738.7

426.4

645.4

325.4

1202.8

1324.8

5283.8

557.1

898.1

340.3

229.0

230.5

2255.0

5283.8

7538.8 (109.1

69

69

638

631

78

109.0

109.0

109.1

109.1

109.1

109.2

104.4

109.6

109.6

109.8

109.9

Autons
campus
61.0 Diff
2.2 mm less
than the median

148/+ Acad. 3 = 151

Campus median
2.2 mm more
than autons

59	60	61	62	63	64	65	66	67
59.3	60.7	61.6	62.8	63.6	63.0 64.8	65.5	66.3	67.8
59.7	60.7	61.2	62.2	63.7	63.0 64.1	65.0	66.2	
59.3	60.1	61.4	62.0	63.4	63.0 64.7	65.5	66.6	
59.1	60.4	61.8	62.5	63.5	63.0 64.1	65.0	66.5	
59.5	60.2	61.9	62.7	63.6	63.1 64.0	65.5	66.4	
59.4	60.7	61.4	62.0	63.8	63.2 64.7	65.8	66.0	
59.2	3628	61.8	62.4	63.0	63.3 64.1	65.0	65.2	
59.1		61.0	61.7	62.0	63.3 63.4 64.1	65.4	66.8	
59.2		61.9	62.2	63.1	63.5 64.6	65.1	66.8	
		61.5	62.1	63.0	63.6 64.6	65.8	66.3	
(57.8 Acad)		61.5	62.6	63.0	63.4 64.2	65.4	66.4	
(59.4)		61.6	62.5	63.2	63.7 64.0	65.2	66.3	
		61.0	62.1	63.0	63.6 64.8	65.6	66.2	
65 1.2		61.5	62.6	63.0	63.5 64.5	65.4	66.1	
10 4		61.0	62.5	63.7	63.2 64.3	65.4	66.1	
		61.7	62.6	63.2	63.7 64.7	65.5	66.0	
		61.8	62.4	63.3	63.6 64.0	65.0	66.0	
		61.2	62.9	63.5	63.2 64.2	65.4	66.0	
		61.1	62.4	63.5	63.8 64.0	65.6	66.0	
		61.7	62.3	63.2	63.4 64.7	65.3	66.0	
		61.6	62.2	63.1	63.5 64.1	65.0	66.0	
		61.6	62.0	63.1	63.5 64.1	65.0	66.0	
		61.5	62.5	63.0	63.4 64.0	65.0	66.0	
		61.4	62.9	63.0	63.4 64.2	65.0	66.0	
		61.5	62.2	63.0	63.4 64.0	65.0	66.0	
		61.5	62.0	63.0	63.4 64.0

59.1	59.3	60.2
111.5	112.1	112.2
102.0	104.0	104.7
272.6	275.4	287.1

La Brea Platygonus cayporetacarpus

Comparison of proximal portion with P. latebrosus and Thanus and Chiriway as well.

Six chars. stand out in latebrosus.

lutosus ext. view
lutosus post. view less marked
lutosus prox. view

① The presence of a well marked extension of the trochlear surface extending beyond the internal surface of the bone as a sharp crest, above & forward of pisiform process.

② The great excavation of the internal side beneath this crest & in the area prox. & emphasizes the crest, prox.

③ Area between pisiform process and junction of metacarpals II and III excavated.

lutosus ext. view

④ North between MI and the trochlea directly on a line with the junction of MI to the body of the bone.

lutosus prox. view

⑤ MI very nearly straight as it projects from the bone.

lutosus post. view

⑥ Proximal portion of MIII concave.

In respect to these six chars. the following is true of the two living Caracaras, lutosus & the La Brea:

① The crest is @ totally absent in chiriway and ⑥ practically absent in Thanus - Some indivs. of © Brea are about like Thanus but some have a noticeable crest. In none is the crest so marked as latebrosus & in none is it completely absent as in chiriway. ⓓ crest present in lutosus (about as in prox.)

② The excavation of the area bet. the trochlea & the pisiform has a decided bearing on the appearance of the crest. @ In chiriway a rounded ridge extends prox'ly from the pisiform to the trochlea with no excavation even immediately below the trochlea. © In Thanus this rounded ridge is less developed & allows a slight excavation before the trochlea is reached. © Brea is like Thanus or with ridge even less developed, thus approaching latebrosus. ⓓ lutosus similar to prox

(3) Area between just fore & junction of M II & III

(a) In cheriway just a faintly depressed line marks the region, within an almost imperceptible rise of the area extending prox from edge of M 3.

(b) In Thanus the depression is more marked in most & the rise of the continuation of M 3 is evident in alb. and abortas as in labebrous

(c) In Brea the rise of the " " " is absent as in Thanus but there is greater excavation immediately beneath the fis. formed itself. This is even more marked than in labebrous. (d) lutrous like labebrous

(f) N orda is anterior to the junction of M I & body of bone in Thanus, cheriway lutrous & Brea. None is like labebrous.

(5) The curvature of M I varies within a species, but none of Thanus of cheriway is as straight as labebrous, nor is lutrous a few Brea approach this straightness but most are like the living spp.

(4) The post portion of M 3 is not concave in either Thanus or cheriway lutrous same of Brea it is, in others, not, so

(1) A clear, not noted in labebrous (bone brothers) is the shape of the posterior contour of the external side of the proximal trochlea, In Thanus the mid-point of the curve is most prominent & extends post'ly, (a) In cheriway, the distal edge of the trochlea is enlarged so that calipers hit it instead of mid-point in meaning or sort of between.

(c) In Brea there is variation - sometimes one pt - sometimes the other & again both so that calipers rest on level lot. the two.

(d) In lutrous like Thanus.

Brea takes a rather middle course, both points touching or nearly so as some the lower one touches first, in others the upper, but in all both pts are close. There are none which decidedly touch below but a few which are more decided above.

Polygonus caupus

	Int. side: crest	Int. side: area bet crest & mist form	Int. side: exc below pisi	Back excav. of M3	Ext. side pointing to north	Ext. side curved M1
P. lateb.	++	slight convex	+	+	B	+
La Brea	+	nearly level	++	+	F	++
	+	slight convex	++	+	F	++
	+	NL	++	+	F	++
	+	NL	++	−	F	++
	+	NL	++	?	F	++
	−	NL	++	−	F	+
	+	SC	++	−	F	++
	weak	SC	++	+	F	++
	+	SC	++	−	F	++
	weak	C	++	−	F	+
	+	SC	++	−	F	++
	+	NL	+	+	F	++
	+	SC	++	−	F	++
	weak	NL	++	+	F	+
	+	NL	++		F	++
Thanu	−	C	+	−	F	++
	−	SC	+	−	F	++
	−	SC	+	−	F	+
	weak	C	+	−	F	++
chaimay	−	C	−	−	F	++
	−	SC	−	−	F	++
	−	C	−	−	F	++
	−	C	−	−	F	++
	−	C	−	−	F	++
	−	C	−	−	F	++

(1) The La Brea bird has (in most instances) a more marked excav. below the pisi form than has either Thanu or latebrosus
T in all is at least as marked.

(2) Nearly all La Brea specimens have at least a weak crest on the int. side, Thanu more so marked as latebrosus.

(3) The area between the pisi form & the trochlea tends to be less convex in the La Brea bird than in Thanu or Chaimay but more so than latebrosus

(4) A few individ. resemble latebrosus in excav. of M3 - most like Thanu & chaimay in this (the chaimay tends even & convex and like Thanu & chaimay in this (the chaimay tends even & convex here which La Brea doesn't)

(5) No L.B. have as weak as far back as latebrosus all like Thanu & chaimay.

(6) Curvature of M1 variable but tends to be as Thanu & chaimay.

Polygonus caprus — meas.

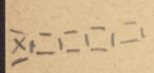
	a (int.) greatest depth	b ext. br. depth	c dt-br MI	d br MI	e from tooth	f from tooth	ea	cd	da	ea	fa	br MI at ip x	xa	dist from ip to ch. y	ya	ba
Thanes																
206	16.0	13.8 13.7	3.4	8.8	6.6	8.6	21.2	38.6	55.0	41.2	53.7	4.9	30.6	6.7	41.8	87.0
18456	16.3	14.3 14.0	3.0	8.9	6.1	8.7	18.1	33.7	53.9	39.4	52.6	5.1	30.9	7.3	44.3	86.7
236	16.3	14.3 13.7	3.3	9.0	6.5	8.3	20.2	36.7	55.2	39.8	51.0	5.5	33.7	7.5	46.0	82.4
18478	17.3	15.1 14.7	3.6	9.6	7.2	9.0	20.8	37.5	55.6	41.6	52.0	5.4	31.2	8.1	46.8	88.0
Cherinag																
19670	15.7	13.9 13.8	2.9	8.8	5.8	7.8	18.5	33.0	56.0	36.9	49.6	4.9	31.2	6.8	43.3	84.3
736	15.7	13.5 13.3	3.0	8.3	6.0	8.1	19.1	36.2	53.0	38.2	51.6	5.3	33.7	6.7	42.6	86.0
1043	16.2	14.1 13.5	2.8	9.1	6.0	8.4	17.3	29.4	58.6	37.0	51.7	5.3	32.9	6.8	42.0	89.5
19671	15.3	13.3 13.4	2.9	8.3	5.8	8.0	18.9	35.0	54.2	37.9	52.3	4.7	30.7	6.6	43.1	87.6
322328	15.6	13.5 13.2										4.7	30.1			
321805 739	16.1	14.3 12.8 13.1										5.3	32.9			
Labebrax																
19921	16.1	—	3.0	8.5	6.4	8.2	18.6	35.3	52.8	39.7	50.9	5.4	33.5	7.8	48.6	
E1268	15.5		3.3	9.5	6.1	8.3	21.2	39.7	61.3	39.3	53.5	5.3	34.2	6.4	41.3	
												5.5	34.8	6.7	42.4	
J8787	15.8		3.0	9.0	6.0	8.3	19.0	33.3	57.0	38.0		5.7	35.1	—	—	
E1949	16.2		3.7	9.1	6.1	8.7	22.8	40.6	56.2	37.6		—	—	6.6	40.7	
H 2339	15.2		3.5	9.2	5.7	7.7	23.0	38.0	60.6	37.5		5.0	33.3	6.6	43.4	
E2644	15.0		3.3	9.0	6.2	8.2	22.0	36.7	60.0	41.3		5.0	32.2	6.7	43.3	
J3889	15.4															
Lutrus																
19916	15.6	13.7 13.2	3.4	8.3	6.4	8.2	22.4		53.2	41.1						

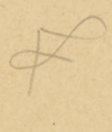
Campus
compared with mcas. of P. lateb[illegible]mus.

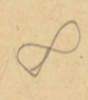
	a Wt Here cent of Metacarpal	b length of M I	c diameter of base of M I	ba	ca	cb
322338	16.6	8.7	2.4	55.8	15.4	27.4 ✓
1043	16.3	10.0	2.2	61.4	13.5	22.0
736	15.6	8.8	2.3	56.4	14.7	26.1 ✓
19670	15.7	9.4	2.0	59.9	12.7	21.2
739	15.6	9.7	2.1	62.2	13.4	21.6
32180s	16.1	9.3	2.3	57.7	14.2	24.7
19671	15.3	8.9	2.2	58.2	14.3	24.7
236	16.4	9.5	2.3	58.0		24.2
18478	17.4	9.8	2.6	56.3		27.8
18456	16.5	9.1	2.5			27.5
206	16.0	8.9	2.4			27.0
E656	15.8	9.3	2.2			23.6
E626	16.3	8.9	2.2			
E1046	16.5	10.1	2.2			
H2836	16.1	9.5	2.5			26.3
J8781	15.3	9.3	2.1			
H2243	16.0	9.1	2.3			
H2833	15.5	8.2	2.0			
E1512	15.9	8.7	2.3			
lateb[illegible]mus	16	9.2	2.5	57.5	15.6	27.2

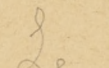
Polyborus - carpus

	a Ant depth	b Lt MI inside	c Dr base M.1	ba	ca
P. labellosus	16.0.	9.0	2.7	56.2	
P. cheriway 736	15.6	8.5	2.9	54.5	
1043	16.1	9.6	2.9	59.6	
322338	15.8	8.6	3.0	55.7	
19670	15.7	9.0	2.8	57.4?	
19671	15.3	8.3	2.8	54.3	









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That no ~~xxxx~~ pages shall be
~~added to the reprints~~
included in this order other than
those bearing the article itself

Caupus

Int. Depth pmx. 24.8 - 25.9 thairs
23.8 - 23.6 fossil
length 24.6 - 27.9 chelung

Br. of cond F 9.2 — 10.0/10.1 - 10.3 T
length C. 9.0 — 9.95

Br. facet 78.0 67.7 — 62.5 T
66.6 63.4 F
Br. condyle C 75.5 — 68.4

Br. cond 35.9 38.7 — 40.8 T
40.4 F
int. depth pmx C 36.0 — 39.2

ext. depth 20.6 21.6 - 22.6
22.5
length 21.4 - 24.2

Dot on rt. - high

Campus measurements by Linard Barnum

no. Pharus	a long pr	b int. alveolar	c ext. alveolar	d sa. pollical facet	e br. B condyle	f length B–115	+ ea	○ da	fa	cb	df	de	+ db	Ba	ca
206	63.1	15.7	14.0	4.3	6.4	8.5	10.1	68.3	13.5	89.3	50.6	67.3	40.7	27.4	24.9	22.2
18478	69.5	17.2	15.0	4.5	7.2	9.8	10.3	67.6	14.0	87.4	45.9	62.5	40.8	26.1	24.8	21.6
18456	63.7	16.6	14.4	4.2	6.6	9.4	10.3	65.9		87.4	42.5	62.5	38.7	24.2	23.9	22.6
296	63.7	16.5	14.4	4.4	6.5	9.2	10.1	69.0		87.4	47.8	67.7	39.3	26.6	25.9	22.6
Cheri																
739	61.7	15.6	13.2	4.3	6.0	9.3	9.7	69.6	15.0	84.7	50	71.6	38.4	27.5	25.7	21.4
1048	63.6	16.3	14.6	4.2	6.0	9.0	9.4	66	14.1	90.3	54	70.0	36.8	25.7	25.6	22.8
786	60.1	15.7	13.5	4.2	6.0	8.3	9.9	69.8	13.8	86.1	51	70 0	38.1	26.8	26.1	22.5
19671	62.2	15.3	13.4	4.1	6.1	8.0	9.8	66	12.8	87.6	50	68.4	39.2		24.6	21.6
19670	63.3	15.8	14.0	4.3	6.7	8.8	9.0	68	13.9	88.6	49	75.5	36.1		25.0	22.1
82 1805	61.3	17.1	14.8	4.3	6.1	9.2	9.95	70.3		86.5	53	69.4	36		27.9	24.2
322338	60.2	—	14.1	4.3	5.6	9.1	9.6	71.5			56	74.2	—			23.4
		✓			✓	✓										
Fossil E656	64.8	15.9	13.5	4.4	6.4	8.3	9.8	67.8	15.1	85		68.8	40.2		24.5	20.8
E3721	63.6	16.5	14.3	4.7	6.4	9.0	10.0	73.9	14.1	86.7		77.5	38.8		25.9	22.5
E3822	66.8	17.1	14.9	4.7	6.6	9.1	98	70.3	14.8			71.2	38.6		25.6	23.3

over

(1) Ratio of breadth of condyle & length = 10.1 – 10.3 in Tharus
9.4 – 10.0 " cheriwa
9.3 – 10.0 " fossil

(2) Contour of external crest of condyle – greatest expansion
at distal tip in cheriwa
" mid-point " Tharus
varies from tip & mid point but seems more evened between them.

Polytoreus - carpometacarpus

a b c d e

fossil	length	int. depth	ext. depth	br. proximal facet	br. condyle	length MC	fa	ta	ca	da	db	ca
H 2274	63.1	15.0	13.0	4.3	6.0	7.8	23.8	9.5	86.7	71.9	40.1	20.6
H 2243	62.5	16.0	13.7	4.7	6.3	8.8	25.6	10.0	85.1	74.5	39.4	21.9
E 1169	62.5	15.1	13.2	4.3	6.1	7.8	24.2	9.7	87.5	70.6	40.4	21.1
H 2833	64.0	15.5	13.3	4.0	5.9	7.2	24.2	9.2	86.1	67.8	38.1	20.8
J 8787	64.0	15.9	13.8	4.3	6.0	8.3	24.8 / 24.9	9.3	87.0	71.6	37.8	21.5
H 2232	63.3	15.8	13.8	4.0	6.1	8.1	24.9	9.6	87.4	65.6	38.6	21.8
E 2708	62.0	15.0	13.0	4.0	6.0	8.0	24.2	9.6	86.7	66.4	40.0	21.0
E 3889	60.3	15.5	13.1	4.0	5.9	9.2	25.7	9.8	84.5	67.8	38.1	21.8
H 2257	59.8	15.1	13.4	3.8	6.0	7.1	25.3	10.0	88.1	63.4	39.7	22.4
H 2832	64.1	15.7	14.0	4.0	6.2	8.0	24.5	9.6	89.3	63.5	39.5	21.8
E 4744	63.7	15.7	13.6	4.4	6.3	8.7	24.7	9.8	86.7	64.8	39.8	21.3
E 3969	63.6	15.9	13.5	4.5	6.3	8.0	25.0	9.9	85.1	71.4	40.1	21.2
E 4266	62.6	15.6	13.7	4.2	5.9	8.1	24.9	9.5		71.3	37.8	21.9
H 2836	62.5	16.0	13.9	4.5	5.8	8.0	25.4	9.3		77.5	36.2	22.2
J 8781	61.6	15.3	13.2	4.3	5.9	7.8	24.9	9.6		72.9	38.7	21.4
E 3689	61.3	15.4	13.3	4.1	6.1	8.0	25.1	9.95		67.3	39.6	21.7
E 1522	64.7	15.9	14.0	4.6	6.2	7.7	23.6	9.6		74.3	39.0	22.6
E 626	61.9	16.4	14.0	4.6	5.9	8.2	26.5	9.5		78.0	35.9	21.6
E 1046	67.0	16.6	14.4	4.6	6.3	7.7	24.8	9.4		73.0	37.9	21.5
H 2254	63.3	16.0	14.1	4.4	5.9	7.9	25.3	9.3		74.7	36.9	22.3
E 1538	65.5	16.4	14.5	4.3	6.3	7.6	25.2	9.6		68.4	35.4	22.1

21) 811 (38.6
63
181
168
134

35.4 – 40.4

Carpometacarpus Recent Caracara

	Length a	Depth prox. end (internal) b	Height of facet for pollex c	Breadth of trochlea d													
cheriway																	
1043	63.8	16.7	10.2	6.0	25.5	63.0	9.7	59.8	39.0	3.5	4.0	2.8	28.9	17.2		15.2	
19670	62.9	15.9	10.0	6.1	24.9	63.7	9.0	57.3	38.8	3.8	4.1	2.9	32.2	18.4		14.3	
19671	62.0	15.3	9.3	6.2	24.7	60.7	8.6	56.2	40.5	3.5	3.9	2.8	32.5	18.3		13.8	
~~32180~~	~~61.3~~	~~14.4~~															
739	61.0	15.5	10.3	6.0	25.2	66.5	9.3	60.0	38.7	3.4	4.0	2.8	30.1	18.0		15.1	
322338	60.8	15.6	9.8	6.3	25.8	62.7	8.7	55.7	40.4	3.5	3.8	3.1	35.6	19.8		14.3	
736	60.2	15.6	9.3	6.0	25.9	59.6	8.5	54.4	38.5	3.6	3.9	2.9	34.9	18.5		14.1	
1220	57.0	15.0	9.0	6.1	25.3	60.0	8.4	56.0	40.6	3.5	3.8	2.8	33.3	18.6	23.3	14.7	
420		14.6		5.7			9.1		39.0								
lutosus																	
19916	61.2	15.5	9.5	6.4	25.4	61.9	8.5	54.8	41.3	3.8	4.2	2.7	31.8	17.4	24.5	13.9	
thamus																	
18478	69.4	17.4	10.7	7.2	25.0	61.6	9.7	55.7	41.4	4.2	4.6	3.4	35.0	19.5	24.1	13.9	
18456	63.6	16.3	10.1	6.4	25.6	62.1	9.0	55.7	39.2	3.6	4.2	2.8	30.8	17.1	22.1	14.1	
236	63.6	16.4	9.7	6.4	25.8	59.2	9.1	55.5	39.0	3.7	4.3	3.2	34.1	19.5	22.5	14.3	
206	63.1	16.0	9.4	6.6	25.4	58.6	8.7	54.3	41.3	3.8	4.2	3.3	37.9	20.6	23.7	13.7	
(from Histories means)																	
forcipatus																	
max	67.8				26.5				40.4								
min	59.1				23.8				35.9								
mean	63.2								38.6								
labefactus		16.1	10.1	6.6			8.8	54.6	41.0	3.6	4.2	2.9	33.0	18.0	22.3		

Campus - fossil Cancana

Meas. of individ. elements same in Lab for final MS

	a length	b Depth mid. valve	c	d Breadth @ umbo	6a	da	L MI	eb	K db	ed
✓E1046	66.9	16.5		6.2	24.7	9.2	9.8	59.4	37.5 ✓	14.6
E1200	66.1	16.6		6.3	25.1	9.5	9.1	54.7	37.9	13.7
E1096	66.0	16.0		6.2	24.7	9.4	9.2	57.9	38.7	13.9
✓E1154	64.7	16.0		6.2	~~24.9~~	9.5	9.5	59.4	38.7 ✓	14.6
E656	64.7	15.7		6.3	24.2	9.4	9.1	58.0	40.1	14.0
✓E1268	64.3	15.5		6.1	24.6	9.5	9.7	62.6	39.3 ✓	15.1
✓H2281 ✓	64.3	16.0		6.5	24.9	10.1	9.4	58.7	40.6 ✓	14.6
H2833	64.0	15.4		6.0	24.1	9.3	8.4	54.6	38.9	13.1
E9993	63.7	16.0		6.0	25.1	9.2	9.5	59.4	37.4	14.9
H2274	63.0	14.9		5.8	23.6 ✓	9.2	8.9	59.6	38.9	14.1
✓E1024	62.8	15.8		6.3	24.1	10.0	9.9	62.6	39.8 ✓	15.7
E1419	62.5	16.0		5.7	25.6	9.1	8.7		35.6 ✓	
E4582	62.2	15.4		5.7	24.8	9.1	9.1		37.0	
H2301 ✓	62.0	15.2		5.9	24.5	9.5	9.5		38.4	
✓E4271	61.8	15.9		6.0	25.7	9.7	9.0		37.7 ✓	
✓J8763 ✓	61.3	15.1		6.1	24.6	9.9	9.2		40.4	
E3263	61.0	14.8 ✓		5.7	23.4	9.3	8.7		39.0	
H2239	61.0	15.2		5.5 ✓	25.4	9.2	9.4		36.2	
✓H2280 ✓	60.6	15.6		6.1	25.7	9.6	9.3	11	39.1 ✓	
H2286 ✓	60.3	15.0		6.1	24.9	9.2	9.0	10.1	40.6 ✓	39.1

	6	d	eb	15
E4977	15.2	6.0	39.4 ✓	
✓3917	16.2	6.2	38.2	
4878	15.8	5.8	36.7	
H2271	15.1	5.7	37.7	
H2816	15.9	6.2	39.0 ✓	
✓E1170	15.2	6.4	42.1	

a = 6 of other sheet

b = 6 of other sheet

40 out of 73 specimens in duplicate with 38–39.990 cases

73 specimens counting those previously measured

	a initial depth	b growth	ba		a	b	ba		a	b	ba
E3721	16.3	6.4	39.3	E1282	16.6	6.7	40.4	E1024	15.8	6.5	41.1
4673	15.0	5.6	37.3	E4744	15.7	6.1	38.8	1154	16.1	6.2	38.5
1042	16.9	6.5	38.4	E636	15.4	5.8	37.7	E3737	16.3	6.6	40.5
H2238	15.8	6.1	38.6	E3969	15.6	6.2	39.7	H2238	16.4	6.4	39.0
H2248	16.0	5.8	36.2	E3822	16.9	6.6	39.0	E1268	15.5	6.0	38.7
E44.4	15.5	6.5	41.8	H3522	16.2	6.0	37.0	H2243	15.9	6.5	40.8
H2281	16.1	6.5	40.3	H2267	15.2	6.1	39.0	E3914	16.3	6.3	38.6
H2280	15.6	6.1	39.1	H2274	14.8	5.7	38.5	E3826	17.0	6.3	37.0
E936	16.7	6.4	38.3	E630	16.4	6.6	40.3	E1046	16.4	6.1	37.2
E4249	15.7	6.4	40.7	E958	16.5	6.3	38.2	E4271	16.0	6.1	38.1
E3384	16.0	6.4	40.0	J8763	15.1	6.1	40.3	E3391	15.5	6.2	40.0
E4653	15.8	5.9	37.3	J8761	15.7	6.1	38.8	E2447	15.1	6.2	41.1
E1047	15.8	6.2	39.2	E1232	16.1	6.2	38.5	E4643	15.6	6.3	40.4
H2301	15.2	6.8	38.1	E1814	15.4	6.0	38.9	E3889	15.5	5.6	36.1
H2820	15.4	6.2	40.3	E848	15.7	6.0	38.2	E4622	15.3	6.1	39.8
E602	15.9	6.2	39.0	E1170	15.2	6.5	42.7	E626	16.2	6.1	37.6
E850	16.0	6.3	39.3	E1896	15.5	6.3	40.6	E2100	16.7	6.6	39.1
E3897	16.7	6.3	37.7	E4046	15.2	6.0	39.4	E1169	15.2	6.0	39.4
E3310	16.7	6.6	39.8	E4187	16.7	6.5	38.9	J8787	15.8	6.1	38.6
H2288	16.0	6.3	39.4	H2290	15.3	5.9	38.5	E4866	15.5	6.0	37.4

ba 35.6 – 42.7

279.8
769.0 | 38.5
1548
120
348
320
288

calcaneus of fossil like chériwa, in narrower condyle
Tharus, " broader
" " shape of ext facet of condyle?

calcaneus like Tharus in presence of ridge perp. from M3 cb

(modified, however)

	a	b	c											
Tharus	Length	W M3	ext d	a int	a	ca	bc		x pal	xc	x on condyle	yc	ya	
206	15.9	63.1	9.0	13.9	14.2	16.0	9.7	22.0	25.4	87.0	4.2	26.2	6.5	40.6	10.3	46.6
236	15.7	63.6	9.3	14.4	14.6	16.4	10.0	22.6	25.8	87.8	4.4	26.8	6.5	39.6	10.2	47.3
18478	15.1	69.5	10.0	15.0	14.4	17.2	10.5	21.6	24.8	87.3	4.6	26.7	7.3	42.4	10.5	46.0
18456	15.9	63.7	9.2	13.6	14.4	16.1	10.1	21.4	25.2	84.5	4.2	26.0	6.6	41.0	10.3	45.6
chériwa 736	16.0	60.0	8.6	13.4	14.3	15.6	9.6	22.4	26.0	86.0	4.1	26.2	6.1	39.1	10.1	46.2
739	16	61.2	9.4	13.1	13.3	15.4	9.8	21.4	25.2	85.3	3.8	24.6	6.1	39.6	9.9	40.4
1043	15.6	63.4	9.7	14.6	15.3	16.2	9.9				4.0	24.6	6.0	37.0	9.4	41.3
fossil E1046		67.0	9.9	14.3	14.7	16.5	21.4	24.8	86.7		4.6	27.8	6.3	38.1	9.4	46.5
E3821		66.6	10.1	14.7	15.1	17.0					4.6	27.0	6.6	38.8	9.8	46.5
H2832		64.1	—	14.0		15.7					—		6.2	39.4	9.6	—
H2232		63.3	9.5	13.7	15.0	15.6					4.1	26.9	6.2	39.7	9.8	
E1503		64.1	9.2	14.6	14.5	16.6					4.3	25.8	—	—	—	46.7
H2264		61.3	8.2	13.2	13.3	15.2					4.1	27.0	6.8	38.1	9.4	50.0
E6516		64.8	9.0	13.5	13.8	15.7					4.3	27.4	6.3	40.1	9.7	47.7
E4744		63.5	9.1	13.6	14.3	15.8					4.4	27.8	6.2	39.2	9.7	48.4
E4266		62.6	8.7	13.7	13.9	15.5					4.0	25.8	6.0	38.6	9.6	46.0
E1538		65.5		14.5		16.4					4.4	26.8	6.4	38.0	9.7	

fossil 97
Thar 90.1
" 97
chér 92

a - breadth (greatest) of external condyle
b - height of ext. condyle
c - breadth of dist. end
e - height of ectepicondylar process
d - height of int. condyle

Tharus	a	b	ab	c	ac	bc	d	dc	e	ec
18456	3.8	8.3	45.7	19.8[9]	19.1	41.8	5.3	26.7	12.6	63.6
18478	4.3	8.6	50	20.7[8]	20.5	41.5	5.7	27.5	13.1	63.4
206	4.3	8.7		20.0	21.4	43.5	5.7	28.4	12.3[2]	61.5
236	4	8.5		18.7	21.2	45.4	5.4	28.8	12.1	64.7
Cheriway										
321805	4.1	8.4	48.7	18.7	21.9	44.8	5.1	27.2	12.0	64.3
1043	4.1	7.9	51.8	18.8	22.2	42.8	5	27.1	12.1	65.4
355				17.3					11.2	64.8
736				17.5					11.7	66.8
788				17.5					11.2	64.6
322338				17.7					11.4	64.4
19671				18.4					12.3	66.8
802				17.3					11.1	64.3
La Brea										
E1080				18.3					12.1	66.1
E4375				18.5					12.1	65.4
E3864				18.9					11.6	61.4
E2614				17.0					11.5	67.6
E725				19.0					11.5	60.6
E1510				18.0					11.9	66.2

Pelvis

	Length of pelvis	Ratio Br. across ilia to length across ilia	Ratio least br. across ilia to length across ilia	Ratio br. across antitrochanters to length of pelvis	Ratio length across ilia to length of pelvis
fossil					
max	61.1	104.8	78.7	75.0	
median	57.5	8			
mean	57.3				
min.	53.8	90.8	66.7	66.8	
cheriwas					
max	60.8	95.5	76.5	66.7	
med.		88.1			
mean					
min.	53.6	83.2	62.5	59.4	
thanus					
max	65.2	100.2	74.1	71.4	56.5
med		95.1			
mean					
min	58.5	89.1	58.6	61.9	46.1
lutrus	57.8	86.9	65.4	66.3	53.2

Length	61.1	53.8	fossil
	60.8	53.6	cheriw
	65.2	58.5	thanus
	57.8	—	lutrus
Breadth to length	75.0	66.8	fossil
	66.7	59.4	cheriwas
	71.4	61.9	thanus
	66.3		lutrus
Br. across ilia to length	104.8	90.8	fossil
	95.5	83.2	cheriwas
	100.2	89.1	thanus
	86.9		lutrus

104.8

cheriwas 95.5 — 86.9 — 83.2

100.2 — 89.1 thanus

104.8 — 90.2

104 3 2 1 0 9 8 7 6 5 4 3 2 1 0 9 8 7 6 5 4 3

Jenna

61 62 63 64 65 66 67 68 69 70 71 72

61.7 ✓ 62.5 ✓ 63.7 ✓ 64.1 ✓ ~~65.8~~ 65.0 ✓ 66.9 ✓ 67.6 ✓ 68.3 ✓ 69.4 ✓ 70.0

62.2 63.8 ✓ 64.4 ~~65.4~~ 65.2 66.3 ✓ ~~67.0~~ ✓ 68.9

63.1 ✓ 63.3 ✓ 64.7 ~~65.2~~ 65.2 66.2 67.1 68.9

62.5 (2 acad) 63.4 64.4 ~~65.6~~ 65.3 66.1 67.7 68.0

250.0 63.1 64.8 ~~65.5~~ 65.3 66.3 67.9 264.1

63.3 (2 acad) 64.3 ~~65.2~~ 65.4 66.2 67.6

300.8 64.2 ~~65.4~~ 65.5 66.2 ~~67.5~~

64.2 (2 acad) ~~65.6~~ 65.6 66.0 (2 acad) ~~67.4~~

64.8 ~~65.5~~ 65.4 530.2 67.9

560.2 64.0 65.8 608.1

~~65.3~~ 65.4

65.0 (1 acad)

784.6

median 65.7 which is just 2mm. less than Lutrus

65.4 with acad.

72.8

70.0

69.4

264.1

608.1

530.2

784.6

580.2

350.8

250.0

61.7

56 3672 (65.5)

33 63 3

8 1 2

2 5 = 95 61

3 3 3

2.8

50 + 6 acad

	a length ant. side	b prox. head	c depth												
736	68.0	11.0	15.5	9.1	22.8	13.3	11.2	16.4	73.7	16.5	24.3	6.3	15.5	6.9	68	7.4	92	61.6
738	69.8	10.0	15.3	9.0	21.9	12.9	11.3	16.2	73.9	15.9	22.8	6.8	15.8	6.7	71	7.0	94.7	59.3
739	71.7	10.1	16.3	9.8	22.7	13.4	12.3		75.6	16.8	23.7	9.3	16.1	7.0	70	7.3	95.7	57.0
new	65.2	11.1	14.6	8.7	22.4	13.3	10.7	16.4	73.4	15.3	23.5		15.3	6.4	70	7.3	87.6	59.7
35 5	69.5	10	6.5	9.3	22.0	13.3	11.4	16.4	74.6	16.0	23.0	8.9	15.5	6.7	71.3	7.4	90.6	58.7

206	67.6	11.4	17.0	9.7	25.1	14.3	12.6	18.5	74.3	18.0	26.7	9.2	16.2	7.1	70	7.7	92.2	56.3
1847 8	79.8	11.4	18.8	10.6	28.7	15.3	13.4	16.7	71.3	19.8	24.8	9.5	18.0	7.8		8.3	94	58.3
234	68.2	11.3	16.1	10.0	23.3	14.7	12.8	18.5	79.6	18.1	26.5	9.7	15.7	7.3		7.7	94.7	57.0
18456	70.6	11.4	16.9	10.6	23.9	14.1	12.9	18.3	76.4	18.0	25.5		17.6	7.7		8.1	92.6	56.2
1994	67.9	11.9	15.6	9.8	23.0	14.4	12.6	18.5	81.1	17.0	25.0		16.3	7.0		7.7	90.9	55.5
E 651	66.8		9.6		14.3	12.1		18.1		16.8	25.1				72			
E 2634	63.8		9.1		14.8	11.0		17.2		15.7	24.6				70	7.8		
4012	66.1	11.6	9.7		14.4			17.2		14.5	23.1							
3817	62.9		8.6		13.6													
E 1320	68.5		8.7		12.7													

Cheniway has narrower & less deep prox. end rel. to length than in Nanus, lutosus, or fossil

depression above fibular sunken into condyle - Thus horizontal in position - in fossil & lutosus & sorty in cheniway - Nanus a bit more vertical & less depressed

fossil - a short stocky bone with a flare to the head region in anterior trochanter with slight indentation just below as seen in post. view - as in lutosus. Nanus flares too but lacks the indent. - seems to widen more evenly & gradually.

Head of fossil & lut. femur may be said to be more upright than Nanus (and ~~some~~ cheniway is closer in this but ~~Both are~~ still less upright

Occasionally a slim fossil ~~m~~ are like cheniway

With very few exceptions all bones have wide space between two muscle scars proximally as in Nanus & lutosus.

	dist between seams at head	to from midway between Thum & head	
new	3.2	14.3	22.3
739	4.6	16.4	28
738	3.9	15.4	25.2
736	3.0	15.5	19.3
206	6.4	17.0	37
18478	5.3	18.0	29
236	4.4	15.6	28.2
10456	6.7	16.8	39.9
E730	4.1	14.7	27.9
1112	4.0	14.9	25
631	4.3	15.8	25
1320	4.3	14.6	
E1210	4.2	14.3	
F4825	3.5	14.6	
E1150	4.4	14.2	
F4394	4.8	14.2	

Femur

Size - 61.7 mm. ♂ 72.8 mm. Cheniway 65.2 - 73.2, Thanus 67.6 - 79.8, lutorius, 67.9.

Characters: The femur in cheniway bends slightly toward the internal side, while in Thanus it appears more nearly straight. The difference in curvature is further emphasized by the external contour of the proximal portion of the bone. In cheniway this contour tends to bend inward, while in Thanus it flares outward. The outer contour along the trochanteric ridge just below it, as seen anteroposteriorly, seems generally more uneven in cheniway than Thanus, lutorius has the breadth of flare of Thanus with, however a greater tendency to curve inward, more as in cheniway. The antero-internal contour is very uneven in lut.

In the fossil the bones vary from straight to curving inward, the more are straight. These contours are more with uneven than even contour & more with more surface of just. face than = with. The trochanteric ridge is more apt to be vertical than slightly (as in lut & Thanus) & more prom. than indef. The inner is so prom. as lut. than with broad proximal than femur

femur - additional specimens to check extremes (combine this sheet with knee slip)

	a length	b prox	c dist	shaft index	da	ca	ba			prox	dist		da	ca	ba
F4825	65.3	16.3	14.9	7.0	10.7		26.0	B869	67.8			8.0	11.7		
E2006	64.4		14.5	7.3				F4778	65.4	17.8	15.2	7.8	11.8	23.1	27.1
E1350				8.0				F4796	67.6	18	13.7			20.3	
F4808	63.7	—	14.3	6.7					63.0	14.5	13.3		?	21.4	23.0
F4798	66.3+			6.8	10.8			E9992	72.8	17.8	16.4			22.2	
E864	66.1		15.6			23.6		J9600	66.1			8.0	12.2		
E996	63.3		14.0			22.1			66.3	17.4					26.2
E609	66.3		14.7					4376	64.6		15.2?			23.6	
4464	65.0			7.3	11.4			D7610	64.6	17.3					27.1
4040	65.1		15.1	7.7	11.8	23.2		E3218	62.2	16.7	15.0	7.8	12.5	24.1	26.4
E1078	65.7	16.7	15.2	7.2	10.9	23.1	25.4	F4803	64.4	15.3	13.5	6.6	10.5	20.9	23.7
E1053	64.1	16.2	14.2				25.3	E4300	61.5+	13.7	—	6.5			
4723	65.4	15.7					24.1	E1319	69.6	18.0	15.8	7.3	10.4	22.5	25.9
4402	62.5	16.4	13.7	7.0	11.2	22.1	26.2						69.1	17.84	
E1444				8.0									96.7	17.98	
F4806	64.3		13.9	6.7	10.4	21.6									
1187	65.6			6.7	10.2										
E3026	67.9	15.7	14.4	6.9	10.1	21.2	23.1								
4613	65.2	16.9	15.4	7.2	9 6.7		25.9								
E1315	67.6	16.5	15.5	7.4		22.9	24.8								
		13.04		14.2056		179.8	209.24								

179.4
209.4

	x	d	l	c			d				x'	y	
	16.3	16.4	68.6	11.2	16.3	23.9	68.4	7.0	10.2	7.4	6.1 3.8	8.9 21.7	14.6
	15.3	15.3	65.0	10.6	16.3	23.9	68.4	7.3	11.2	7.0	5.8 3.9	8.9 22.6	14.7
	16.5	16.9	68.2	11.4	16.7	24.5	68.3	7.3	10.7	7.0	6.4 3.6	9.4 21.2	14.5 15.5
		16.3	64.3	11.5	16.6	23.5	70.7	7.4	10.6	7.4	6.3 3.9	9.1	
	16.9	17.0	71.9	12.3	17.1	23.6	72.4	7.4	10.3	7.4	6.4 4.3	8.9 21.7	15.3 16.4
	16.0	16.0	69.9	11.3	16.2	22.9	70.7	7.0	10.0	7.4	6.3 3.8	9.0 21.6	15.2 16.4
Lubaus 196	17.0	17.1	68.0	12.5	18.3	25.1	73.5	7.7	11.3	7.7	6.8 4.0	10.0 23.2	15.8 16.8
Thaus													
	17.2	17.3	68.3	12.8	18.8	25.3	74.0	7.6	11.1	7.6	6.8 4.1	9.9 23.3	15.7 16.4
	18.0	18.3	70.7	13.1	18.5	25.8	71.6	8.0	11.3	7.6	7.0 4.0	9.9 23.0	16.7 17.9
	19.8	19.9	79.9	13.5	16.9	24.9	67.9	8.2	11.2	6.0	7.2 4.9	9.6 21.6	17.3 18.2
	18.0	18.1	67.7	12.6	18.6	26.7	69.7	7.7	11.3	7.5	7.0 4.2	10.3 23.6	15.8 16.9

X br at greatest extent of trans. th. straight

* br distinct just below ext. process of fib. cartilage

Fossil Cassiopella femur		width	length	depth prox	ob	ab	Gr. head depth	x6				
xb E1112		16.7	65.4	—		25.5	6.4 6.3	9.7				
23.2 E3814	14.6	14.6	63.0	10.6	16.8	23.2	5.7 3.5	9.0	13.4	21.3	7.0	11.1
26.0 E984	17.9	18.1	68.9	12.7	18.4	26.2	7.0 4.4	10.1	15.7	22.8	7.9	11.4
24.0 E2638		16.0	63.8	11.0	17.2	25.1	6.4 4.1	10.0				
E3883		17.2	66.2	12.1	18.3	26.0	—	—				
24.0 E4012	17.2	17.3	66.2	12.3	18.6	26.1	6.6 3.8	9.9	14.6	22.0	7.8	11.7
E651			66.8								7.8	11.6
24.6 3610	16.1	16.1	65.5			24.6			14.6	22.2	7.3	11.1
25.2 943	16.7		66.2			2			13.2	20.0	7.6	11.4
167			63.7						14.6	22.9	7.3	11.4
25.2 712	16.9		67.0						15.1	23.7	7.2	10.7
23.6 1344	16.3		69.2						14.2	20.3	7.5	10.8
4080			63.7						14.6	22.9	7.3	11.4
F4744			65.1						14.4	22.1	6.9	10.6
E1004			66.1						14.2	21.5	7.0	10.6
E907			67.6						14.7	21.4	7.0	10.3
D7610			64.6						15.2	23.5	7.9	12.2
24.2 E730	16.3	16.5	67.3						14.4	21.7	7.7	11.4
195.8 (24.4		1460								287.1	1677	(11.1
8 (6		23.2								22.0	15	
3 prox Gr.		21.2 - 26.0		70 - 24.4							1.7	
dist Gr		21.8 - 23.7		70 - 22.0							2	
sh Gr		10.3 - 12.2		70 11.1								

chert fossil Miami

Tibia Polybrus

Br dist
length 11.2 – 12.0 (1)

Br sh
length 5.34 – 5.59 (3)

Br prox
length 10.8 – 11.2 (1)

Br prox
depth prox

Dist sh
dist length

Br sh
Br dist 45.3 – 47.7

depth prox
length 13.1 – 13.4 (2)

① Relative Breadth of prox & dist. ends intermediate between cherdway & Miami, overlapping both

② Rel Depth prox. end greater Miami cherdway, & overlapping Miami above (Miami slenderer)

③ Relative Breadth of shaft greater Miami cherdway – overlapping Miami above (Rel & length)

No osteological characters of value in ident. as far as I can see

April 21, 1937

Trinil fibria Polychoms

	length to dent	length to notch	br dist	br prox	depth prox	ba	ca	da	de	ea	br to dist end	br th
E1482	106.4	104.9	12.3			98.6	11.5				52.0	6.4
E1487	107.5	106.2	13.1			99.0	12.1					
E4594	106.0	104.8	13.0			94.0	12.2				47.5	6.3
E3954	101.8	100.2	12.7	11.7	15.3		12.5	11.5	76.5	15.0	49.6	6.3
E6553	107.3	106.5	13.1	12.7	15.6		12.2	11.9	82.1	14.5		
E1483	106.0	104.3	13.0		15.2		12.2	—		14.3	53.0	6.9
E3978	107.4	106.5	12.3	11.9	15.3		11.4	11.0	77.8	14.2	50.4	6.2
E1329	101.4	100.6	12.2				12.1				50.7	6.2
E4962	105.2	103.8	13.0	12.7	15.8		12.5	12.0	80.4	15.0	50.7	6.6
E4112	110.1	108.5	13.1	13.0	16.2		12.4	11.8	80.3	14.7	51.1	6.9
E3550	109.4	108.2		12.2	15.5		—	11.1	78.7	14.1		6.5
E937	112.2	111.2	13.8				12.4					
E2055	108.1	106.5	13.5				12.6					
E872		109.6	13.1				11.9				51.9	6.8
E1174	108.6	107.1	12.9	12.7			12.0	11.7			52.6	6.8
E4493	103.5		13.3				—					
F6739	106.2	104.3		12.0			—				1	
E1539		105.8	13.2				12.4				50.0	6.6
			13.0					7810				
			10 2080	12.8				115			11 519.5	
			10	13.0							50.8	
			48	25 8								
				2 12.9								

Cherrieway tubies	a long. tot. max	b long. tot. sup.	c br. diat.	d br. prox	depth prox	ba	ca	cb	da	de ant	ea
1043 st	119.3	117.7	13.8	12.8	15.9	99.6	11.6	11.7	10.7	80.5	13.3
1220 "	109.0	107.5	13.0	12.7	15.5	98.7	11.9	12.1	11.6	82.0	14.2

OK

g - from mid anterior parietal rugosity to post-most top

Talyosaurus Tibiotarsus

	takeoff dist. end flat to	? heel / ? heel end	Gr dist	depth dist	least Gr dist shaft	Gr prox	dist prox	X	dist	X		?	X	just Gr at crest			
	a	b	c	d	e	f	g	g/b	d/c	e/b	f/b	f/g	g/c	h	fb	db	gb
Thanus																	
206	109.1	109.2	13.5	10.3	6.8	13.2	15.2	12.2	76.4	6.23	12.1	85.6	50.3	14.8	89.4	9.73	13.9
18456	111.8	112.1	14.0	11.3	7.4	14.4	16.6	12.4	80.7	6.7	12.8	86.7	50.0	17.0	84.8	10.08	148
236	107.6	107.8	13.6	10.4	7.1	13.5	16.0	12.7	76.6	6.7	12.5	84.5	52.2	15.3	88.7	9.65	14.8
18478	121.7	122.1	14.9	11.9	7.7	14.5	16.8	12.2	79.7	6.3	11.8	86.4	51.6	16.9	85.8	9.74	13.7
Lutrovus																	
14916	108.0	108.3	13.1	10.5	6.6	13.5	16.0	12.6		6.09	12.9	84.4	48.2	15.5			14.7
Cheniwey																	
1043	116.8	117.1	13.6	10.5	6.5	12.8	15.9	11.6	77.3	5.55	10.9	80.5	47.7	15.8	81.0	8.97	13.2
736	111.7	111.8	13.0	10.1	6.2	12.3	15.0	11.6	77.8	5.55	11.0	82.1	47.6	15.0	82.1	9.06	13.4
739	118.1	119.0	13.4	10.7	6.4	12.9	15.6	11.2	79.9	5.37	10.8	82.7	47.7	15.4	83.8	9.03	13.1
19671	114.1	114.2	13.5	10.6	6.1	12.7	15.1	11.8	78.6	5.34	11.1	84.3	45.3	15.2	83.6	9.26	13.2
3515	114.0	114.4	13.8	10.3	6.4	12.9	—	12.0	74.7	5.59	11.2	—	46.4	15.0	86.1	9.03	—
322338	115.3	115.7	13.5	10.2	6.3	—	15.4	11.7	75.6	5.56	—	—	46.6	15.4?	—	8.84	13.3
1220		107.7	13.1	9.2	6.3	12.7	15.4	12.1			11.8			14.6			
fesint																	
E4112	108.4	109.0	13.3	10.0	6.9	13.0	15.0	12.2	75.3	6.33	11.9	86.7	51.8	14.7	88.5	9.17	13.7
E3978	106.0	106.4	12.3	10.0	6.2	11.9	14.6	11.5	81.5	5.83	11.1	81.9	50.4	14.6	81.5	9.41	13.7
E1174	107.0	107.3	12.8	10.0	6.8	12.7	15.1	11.9	78.3	6.34	11.8	84.2	53.1	15.8	89.3	9.31	14.0
E3954	100.5	100.7	12.7	9.6	6.3	11.8	14.6	12.6	75.6	6.24	11.7	80.8	49.4	14.3	82.6	9.54	14.5
E4762	103.8	103.9	12.4	9.9	6.6	12.6	15.2	12.4	76.7	6.36	12.1	82.8	51.1	14.2	88.7	9.53	14.4
E1379	100.4	101.0	12.2	9.5	6.2	11.6	14.0	12.1		6.14	11.5		50.7	13.4?	86.7	9.41	13.8
E1483	104.4	104.8	12.9	9.3	6.9	12.8	14.5	12.3		6.58	12.2		53.5	15.1?	84.8	8.89	13.8
E1482	104.8	105.1	12.3	9.4	6.4	12.1	14.4	11.7		6.09	11.5		52.0			8.93	13.7
E1228	—	108.0	—	—	6.6	12.4	15.3	—	—	6.1	11.5		—			—	14.1
E1003	107.2	107.5	12.8	9.9	6.5	—	—	11.9		6.05	—		50.7			9.20	—
E4596	104.7	105.0	13.1	9.8?	6.3	—	—	12.4		6.10	—		48.1			9.33?	—
E872	109.3	109.7	13.0	—	6.8?	—	—	11.8		6.24	—		52.4			—	—
E3530	108.2	108.6	12.8	9.4	6.5	12.2	14.7	11.8		6.0	11.2		50.7	—	—	8.67	13.5
E1539	105.8	106.2	13.2	10.2	6.6	—	—	12.4		6.2	11.2		50.0			8.66	—

13/166 3/12.8 14/9 1/6/6 #23 1

Tibia

	a length	b prox dist	c bre sha	ca	x	y	x/y	y/a	x/a		
236	107.7	13.7		12.7	13.5	17.0	79.5	15.8	12.5	5.2	7.1
206	109.1	13.5		12.3	13.0	16.0	81.3	14.6	11.9	4.8	7.3
18478	122.1	14.8		12.1	14.5	17.8	81.4	14.5	11.8	5.8	7.8
18456	112.0	14.0		12.5	14.5	17.4	83.4	15.0	12.9		
1043	117.7	13.8		11.7	12.8	16.5	77.7		10.9		
19071	114.5	13.4		11.7	12.7	16.1	79.0		11.0		
739	119.2	13.4		11.2	13.0	16.4	79.4		10.9		
322338	115.6	13.5		11.6							
355	114.3	13.7		11.9	13.0				11.3		
736	111.7	13.0		11.6	12.3	16.0	77.0		10.5	5.1	6.9
E1487	106.1	13.1		12.3							
E3530	108.2	12.9		11.9	12.3	15.5	79.4		11.3		
E653	106.5	13.1		12.3	12.9	15.7	82.3		12.1		
E1174	107.4	12.7		11.8	12.8				11.9		
E2055	106.7	13.2		12.5	12.8	16.6	77.3		12.0		
E987	111.4	13.7		12.3							
E4112	109.1	13.4		12.2	12.8	16.1	79.5		11.7		
E3978	106.4	12.3		11.5	11.9	15.4	77.4		11.1		
E3954	100.7	12.7		12.6	11.8	15.4	76.7		11.7		
E872	110.0	12.8		11.6							
E4762	103.9	13.0		12.5	12.5	15.8	79.3		12.0		
E1379	100.7	12.2			11.6	14.7				4.5	6.4

Polybrachia Fibia

from ops. Cuts

	Br. dist to length	br. sh to length
C739	11.3	5.5
T1845	12.6	6.4
T1858	12.1	6.1
C1043	11.7	5.4
C355	12.0	5.8
T236	12.6	6.5
T206	12.3	6.2
C736	11.6	5.7

Median = 106.2 which is 8.4 less than last year's 38 Tibia

100 101 102 103 104 105 106 107 108 109 110 111 112

100.7 101.0 102.2 103.7 104.7 105.0 106.6 106.0 107.5 108.2 109.5 110.3 111.2 112.3

100.5

104.3 105.5 106.6 106.2 107.7 108.4 109.8

104.5 105.0 106.8 106.4 107.0 108.5 109.7

104.8 105.8 106.4 106.3 107.3

107.3 105.3 106.5 106.6 107.0

105.1 106.2 106.4

105.3 106.0 106.8

Tursus

In Thamis & lutrinus (1) Internal side of shaft above ~~[illegible]~~ canter definitely furrowed and angular in its outline as it slants forward from the posterior edge to the ant. edge near the prox. end. In Cheriway this portion of shaft not markedly furrowed. Also some indivs have slight depression near the posterior edge. Posterior outline is not angular but curved.

Fossil like Thamus & lutrinus this angularity is not so marked in all.

Furrowing extends more markedly up to anterior edge in lutrinus than in Thamus & not at all in cheriway.

Fossil like lutrinus

(2) The median trochlea is broader relative to length of bone in Thamus 59.0-64.4 than in cheriway 52.5-56.3 or lutrinus 56.4-64.4 sd. median 54.7-60.7. The first overlaps both groups

Sigl: 81.9-93.4 with median 89.0 + mean 88.5

cheriway 8 spec. 1 larger than median; Thamus 3-1 longer; lutrinus 9-7 long with complete shel. of lutrinus 3mm. above median.

	ac dist	b. ht.	e Length	Carinus bc		ac	ba	
1220	14.7	4.8	87.8	54.7		16.7	32.6	
739	14.5	5.1	91.7	55.6		15.8	35.2	32.6 – 36.8
420	14.1	4.8	91.4	52.5		15.4	34.0	
736	14.4	5.3	94.2	56.3	52.5 – 56.3	15.2	36.8	
1043	15.5	5.3	97.3	54.5		15.9	34.2	
321803		5.4	95.8	56.3				
322338		5.2	93.4	55.7				
19671		5.3	95.8	55.3				
206	14.8	5.3	89.4	59.4		16.5	35.8	
18478	16.5	6.0	101.8	59.0	59.0 – 64.4	16.2	36.3	34.6 – 36.4
234	15.6	5.4	88.3	61.3		17.6	34.6	
18436	15.8	5.8	90.1	64.4		17.5	36.4	
19916	14.6	5.2	92.2	56.4		15.8	35.6	
E4738		5.0	89.6	55.6				
G2870		5.0	88.9	56.3				
E3674		5.3	89.9	59.0				
E 751		4.9	89.0	55.1	54.7 – 60.7			
E1431		5.0	84.7	55.7				
E1449		5.1	90.1	56.6				
E 752		5.4	91.7	59.2				
E1181		5.5	90.5	60.7				
E 681		5.2	91.2	57.0				
E3936		4.4	89.7	54.7				

57.0 = mean

490

Corbicula 14.2 3.0

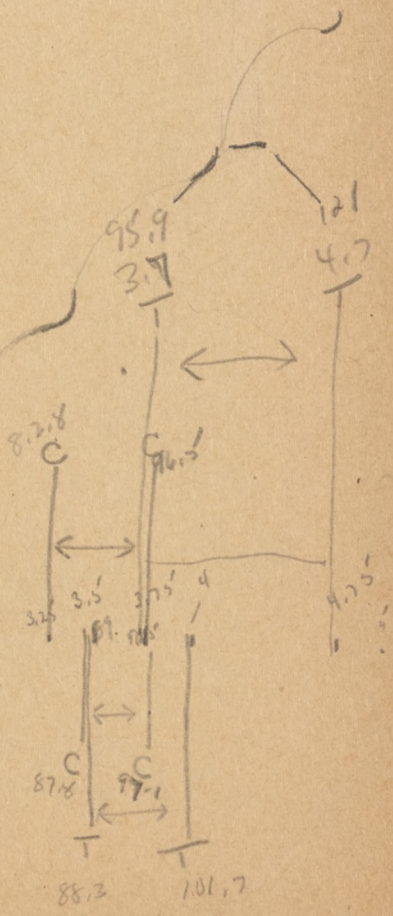
117 4.1 9 (36.6)

55.

69

61.5

35.2



Distrib. of rel. br. jaw and
according to Leyton & Tarnos

94.2 — 89.5 — 89.0 — 82.0

								(84.7)														
								1471														
								(88.6)	(88.2)			(87.7)					(86.0)		(89.5	(84.0)		
								937	4593			1281					3294		1308	2972		
				(87.4)				(89.0	(88.4)		(88.4)	(88.8)		(88.3)	(85.3)		(89.1)		(82.0)	(84.3)		(82.9
				3069				4541	3936		608	1129		2921	748		898		865 2	1373		603
13.4 —	13.6 —	13.8 —	14.0	1	2	3	4	6	7	8	9	10	11	2	3	4	5	6	7		16,1	
(94.1)	(93.3)	(94.2)	(90.9)	(92.2)		(92.7)	(92.3)	(91.2)	(91.3)		(90.0)											
816	3090	679	4151	2941		3550	3091	1535	761		1450											
(90.2)			(90.1)				(91.6)	(91.0)														
7807			1449				3535	1249														

Distributions rel. to no. of distal end according to length of tarsus

Distribution of breadth/shaft ratios according to length of femur (short length above, long " below) (nos. are cat. nos. of specs.)

94.2–82.0

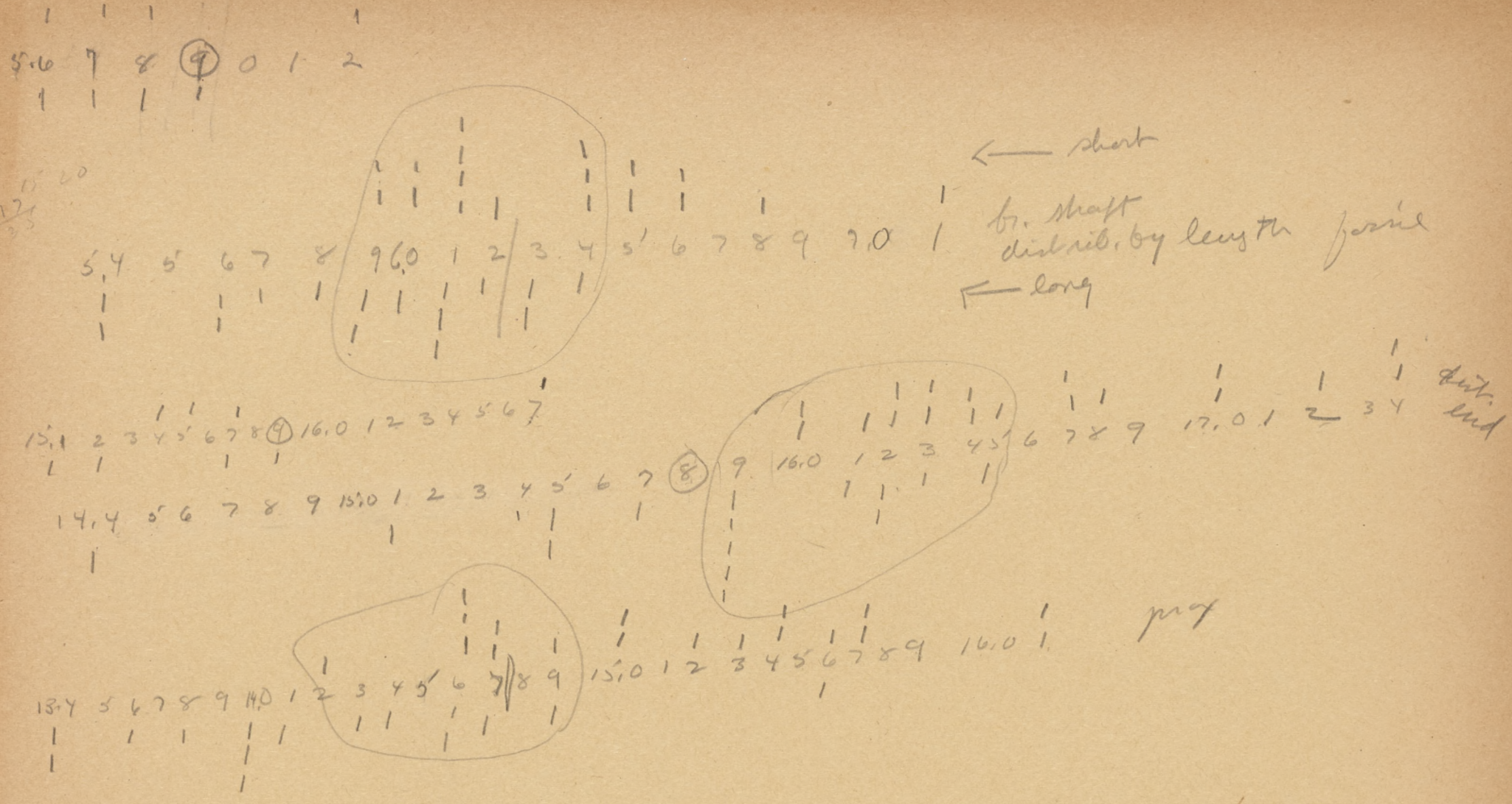
94.2–89.5

89.1–82.0

ratio to shaft length	.5	.6	.7	.8	.9	6.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	7.0	.1
	5.4 (92.7) 3550 (90.2) 4807	(94.1) 816 (93.3) 3090	(94.2) 679	(91.0) 1249	2941	761	3091	4151	(91.8) 819 (91.2) 1535								
					1450		3535										
					1449												
							(84.3) 1373										
							(85.4) 1555										
						(88.4) 608	(87.7) 1281										
					(87.9) 3069	(88.8) 1129	(88.4) 3936	(84.7) 1471									
					5.9 (92.2) 2941 (90.0) 1450 (89.1) 898	6.0 (91.5) 761	6.1 (92.3) 3091 (91.6) 3535 (90.1) 1449	.2 (90.9) 4151									

82–86

90–94


short
br. shaft distrib. by length fascic
long
dist. end
pr

Polyporus - La Brea - Tarsus

	a length	b part	c dist	d mid shaft	ba	ca	da	bc				a length	b part	c dist	d mid shaft	ba	ca	da	bc
E679	94.2	13.0	15.3	5.4	13.8	16.2	5.7	85.0			E1129	88.8	13.1	14.8	5.4	15.0	16.1	6.0 X	
816	94.1	12.6	14.2	5.3	13.7	15.1	5.6	88.7			937	88.6	13.0	14.4	5.7	14.6	16.2	6.4 X	
3090	93.3	12.7	14.5'	5.3	13.6	15.5'	5.4	89.5			608	88.4	13.2	14.6	5.3	14.9	16.5'	6.0 X	
3550	92.7	13.3	14.4	5.0	14.3	15.5'	5.4	92.3	4.7	32.6	3936	88.4	13.0	14.4	5.4	14.7	16.2	6.1 X	
3091	92.3	13.3	14.7	5.7	14.4	15.9	6.1 X	90.6			62421	88.3	13.4	14.8	6.0	15.2	16.8	6.8	
62941	92.2	13.0	14.7	5.5'	14.1	15.9	5.9 X	84.5			4593	88.2	13.0	14.5'	5.8	14.7	16.4	6.5'	
E819	91.8	—	14.6	5.8	—	15.9	6.3 X	—			3069	87.9	12.5'	14.1	5.2	14.2	16.0	5.9 X	—
761	91.5'	13.5'	14.6	5.5'	14.7	15.9	6.0 X	92.5			1281	87.7	13.2	14.4	5.4	15.0	16.4	6.1 X	
3535'	91.6	12.9	14.1	5.6	14.0	15.4	6.1 X	91.5			3294	86.0	13.3	15.0	5.6	15.4	17.4	6.5'	
1535	91.2	13.3	14.5'	5.8	14.6	15.9	6.3 X	91.7			1455'	85.4	—	13.7	5.2	—	16.0	6.1 X	
1249	91.0	13.3	14.8	5.3	14.6	16.2	5.8	90.0	3.3	22.7	748	85.3	13.1	13.9?	5.5'	15.3	16.3	6.4 X	
4151	90.9	12.8	14.3	5.7	14.0	15.7	6.2 X	89.6	3.5	24.4	1471	84.7	12.4	14.2	5.3	14.6	16.7	6.2 X	
4807	90.2	12.1	13.0	4.9	13.4	14.4	5.4	93.1	4.7	36.0	1373	84.3	13.3	14.3	5.2	15.7	17.0	6.1 X	
1449	90.1	12.7	14.5'	5.5'	14.0	16.1	6.1 X	87.6	162		62972	84.0	13.2	14.0	5.6	15.7	16.7	6.6	2.5' 17.8
1450	90.0	13.4	14.7	5.3	14.9	16.3	5.9 X	91.3			E603	82.9	13.4	14.1	5.9	16.1	17.0	7.1	
1308	89.5'	14.0	14.8	5.8	15.6	16.5'	6.4 X	94.6			1365	82.0	12.8	14.1	5.4	15.6	17.2	6.6	
62926	89.4	13.3	14.5'	5.3	14.9	16.2	5.9 —	91.7											
E898	89.1	13.8	15.1'	5.3	15.4	17.4	5.9 X												
4541	89.0	13.0	14.5'	5.7	14.6	16.3	6.4 X												
		2361	2762	103.7	14.3	15.9	5.9												
		13.0 – 15.5			2563	3023	1130												
					18	19	19												
					38	42	38												
					73	84	77												
					146	163	189												
					73	79	112												

Cheriway – 82.8 – 96.5
Thames – 95.9 – 121.0
Sutoria 89.5 – 96.5
} Ridgway

Modern Polybones - Tarsus

	a length	b prox	c dist	d mid shaft	ba	ca	da	be	a troch	ac	b dist epi dorsal foramina	fc
Cheriway 1043	97.4	13.7	15.5	5.7	14.0	15.9	5.8	88.5	5.4	34.8	1.1	7.1
19670	96.7	13.6	15.2	5.7	14.0	15.7	5.9	89.5			2.0	13.1
739 ♀	96.6	13.3	14.6	5.5	13.7	15.1	5.7	91.2	5.1	34.8	2.4	16.4
19671	95.7	13.5	14.6	5.4	14.0	15.2	5.6	92.5			2.9	19.1
736 ♂	94.5	13.3	14.6	5.4	14.0	15.4	5.7	91.2	5.2	35.6	2.4	16.4
3223387 ♀	93.5	13.3	14.5	5.3	14.2	15.5	5.6	91.7			2.0	13.7
420 ♀	91.4	13.0	14.4	5.2	14.2	15.7	5.8	90.3	4.9	34.0	0.0	0.0
1220 ♂	87.8	13.1	14.7	5.5	14.4	16.7	6.2	89.3	4.9	33.3	1.6	10.9
				8)	1130 / 14.1	1252 / 15.6	8) 46.4 / 5.8				9) 18 5 (1.4	
Sutoria 19916	92.2	13.8	14.6	5.7	14.9	15.8	6.1	94.6			4.6	31.5
Thames 18478	101.8	15.1	16.7	5.7	14.8	16.4	5.6	90.5	5.9	35.3	2.7	16.1
18456	90.1	14.4	15.7	6.5	15.9	17.4	7.2	91.7	5.8	36.9	3.4	21.6
206	89.5	13.6	14.8	5.4	15.2	16.6	6.0	91.3	5.4	36.2	3.4	23.0
236	88.3	13.7	15.7	6.6	15.5	17.8	7.4	87.4	5.4	34.4	2.7	17.3
				4)	61.4 / 15.3	68.2 / 17.0	26.2 / 6.5				2.6 – 3.4	
											4) 12 2 (3.0	

July 17, 1937

Taurus - Attempt to find extremes - lower or higher than those already used.

	a print	b dist	c touch	d length	e slope	cd	ad	ed	bd	cb	dist feet dist. journ.
E 1745		14.0	4.8	81.3					17.2	34.2	
E 797	12.1	13.6	4.7	92.2			13.1		14.9	34.5	
E 3792	12.8	13.6	4.6	90.0						37.0	
E 2980	12.3	13.1	4.7	84.1						35.6	
E 1458	12.9	13.6	4.4	89.7		7.9				32.3	
E 3918	12.2	13.7	4.5							33.6	
				91.3	5.0						
E 1486	12.4	—	-	89.6	4.8			5.3		?	
E 1809	12.6	14.0	4.8	89.3	4.8					34.2	
E 785	12.6	14.3	4.5	86.4	4.8					31.4	
E 4718		13.8									3.5
E 1900		14.0									3.1

14.6 – 36.0 % mean = 3.7

2.0 – 5.8

	Br. distal	dist. dist. distance for.	
E1446	13.5	2.0	14.8
3950	15.3	3.9	25.4
613	14.5	2.2	15.1
1488	14.8	2.9	19.5
4718	14.1	3.7	26.2
2363	14.0	3.5	25.0
956	15.0	2.6	17.3
752	15.3	3.0	19.6
924	14.6	4.8	32.8
F1012	15.2	4.6	30.2
E882	15.0	5.0	33.3
1453	14.3	4.3	30.0
1056	13.9	4.9	35.2
615	15.0	4.0	26.6
1178	13.9	3.0	20.5
2024	14.5	2.5	17.2
788	15.1	5.8	38.4
99 J9913	13.7	2.0	14.6
3294	15.1	5.4	35.7

Hor	13.7	4.0	29.2
"	13.3	3.7	27.8
"		3.5	
"		3.0	
Cook	14.2	3.1	21.8

19 | 70.1 | 3.7
57
13.1

70.1
16.2
2.3
8 | 3.7
8
24 | 8 2 | 4
7 | 4 8
1 | 4 8
1.4

81.9 - 94.8

E4593 88.2
898 89.1
4151 90.9
679 94.2
1449 90.2
1247 91.0
1281 87.8
G2921 88.3
G2926 89.4
E761 91.7
3090 93.3
816 94.1
603 82.9
608 88.4
3294 86.0
1471 84.7
1555 85.4
1373 84.3
748 85.3
3091 92.3
G2972 84.0
E1308 89.5
3550 92.7
3069 87.9
937 89.6
G2941 92.2
E1450 89.9
819 91.8
1129 88.8
681 91.2
3936 88.4
3535 91.5

679 94.2
816 94.1
3090 93.3
3550 92.7
3091 92.3
G2941 92.2
819 91.8
761 91.7
3535 91.5
1435 91.2
681 91.2
1249 91.0
4151 90.9
4807 90.2
1449 90.1
E1450 89.9
E1308 89.5
G2926 89.4
937 89.6
898 89.1
4541 89.0
1129 88.8
3936 88.4
608 88.4
G2921 88.3
E4593 88.2
3069 87.9
1281 87.8
3294 86.0
1555 85.4
748 85.3
1471 84.7
1373 84.3
G2972 84.0
603 82.9
E3652 82.0

Tarsonema
P. pulcherrimus

1043	97.4	13				
19670	96.7	13.6	15.2	5.7	14.0	
739	96.6	13.3	14.6	5.5	13.7	15.1
19671	95.7	13.5	14.6	5.4	14.0	
736	94.5	13.3	14.6	5.4	14.0	15.4
322338	93.6	13.3	14.5	5.3	14.2	
420	91.4	13.0	14.4	5.2	14.2	
1220	87.8	13.1	14.7	5.5	14.9	16.7

94 %	93 %	92 %	91 %	90 %
94.1 15.9	93.3 15.3	92.3 15.8	~~91.9 15.2~~	90.9 15.4
94.1 15.0	93.6 16.0	92.2 15.9	91.0 16.1	90.2 16.0
		92.7 15.4	91.7 15.8	90.2 15.8
		92.2 16.0	91.0 15.9	90.5 15.0
		92.2 15.8	91.8 15.7	90.1 14.4
		92.0 14.7	91.2 16.4	
			91.3 15.9	
			91.6 15.5	

89 %	88 %	87 %	86 %	85 %	84 %	83 %	82 %	81
~~89.3 17.1~~	88.2 16.4	87.8 16.2	86.0 17.3	85.4 16.0	84.7 16.7	83.3 17.0	81.9 17.0	
89.1 17.1	88.3 16.3	87.9 16.0	86.8 15.5	85.0 16.4	84.3 16.8	83.4 16.1	82.9 16.7	
89.0 16.7	88.8 16.4	87.9 16.4		85.3 —	84.0 16.9			
89.4 16.3	88.4 16.5	87.8 16.8						
89.0 16.2								
89.4 16.2								
89.5 16.4								
89.6 16.0								
89.9 16.4								

15.0 16.0
15.3 16.0
15.4

14.7
15.8
15.8
15.9
15.9

17.7 ~~17.0~~ – 17.3
11

14	15	16	17
1	IIII IIII	III	94 – 90
		IIII IIII	II 82 – 85
1	III	III	II 86 – 89

fossil taxa with ratio of br. to length to show rel. stoutness according to size.

94.1

RSB Polybrons + cases

% = length + br. dist. ind

15, %	16 %	17 %
90.9 – 15.4 %	88.2 – 16.4 %	89.1 – 17.1 %
94.1 – 15.9 %	89.0 – 16.7 %	81.9 – 17.0
91.7 – 15.8	90.2 – 16.0 %	86.0 – 17.3
93.3 – 15.3	91.0 – 16.1	
94.1 – 15.0	87.8 – 16.2	
	88.3 – 16.6	
	89.4 – 16.3	
	89.0 – 16.2	
	82.9 – 16.7	
	89.4 – 16.2	

% show correlation of size x breadth of dist and – of any factors

13 dist.	14 dist.	15 dist
82.9 – 13.8	88.2 – 14.5'	89.1 – 15.3
	90.9 – 14.0	94.1 – 15.0
	89.0 – 14.9	86.0 – 15.0
	90.2 14.5'	
	91.0 – 14.7	
	87.8 – 14.3	
	88.3 – 14.7	
	89.4 – 14.6	
	87.0 – 14.5'	
	91.7 14.5'	
	93.3 14.3	
	81.9 – 14.1	
	94.1 – 14.2	
	89.4 – 14.5'	

14.0 – 4	14.5 – 9
90.9 – 14.0	88.2 – 14.5
87.8 – 14.3	89.0 – 14.9
93.3 – 14.3	90.2 – 14.1
81.9 – 14.1	91.0 – 14.7
94.1 – 14.2	88.3 – 14.7
	89.4 – 14.6
	89.0 – 14.5'
	89.7 – 14.5'

Tarso-metatarsus

a – length
b – breadth of shaft
c – length of hypotarsus
d – breadth of prox. end
e = " " of middle trochlea

Thamnophilus	a	b	b/a	c	d	c/a	c/d	b/d	d/a	e	e/a	b'	b'/a	e/f	b'/f
18456	90.6	6.3	6.95	12.1	14.6	33.5	83.0	43.1	16.1	5.8	6.4	15.9	17.5	36.4	
206	89.5	5.1	5.70	12.9	13.6	44.2	94.9	37.5	15.2	5.4	6.1	15.0	16.7	36.0	
18478	101.8	5.5	5.40	12.3	15.1	20.7	81.5	36.4	14.8	5.9	5.8	16.8	16.5	35.1	
236	88.4	5.9	6.68	12.4	13.9	40.4	89.3	42.4	15.7	5.3	6.0	15.8	17.8	33.5	
Cleriway										✓		✓			
19671	95.8	5.3	5.53	11.8	13.7	23.2	86.3	38.6	14.3	5.3	5.53	14.0	15.3	36.0	
420	91.5	5.0	6.46	11.5	13.2	25.7	87.3	37.8	14.4	4.8	5.24	14.6	15.9	32.9	
736	94.5	5.2	5.50	12.4	13.3	41.7	93.4	39.1	14.1	5.1	5.5	14.5	15.3	35.2	
739	96.6	5.5	5.70	12.6	13.4	30.4	94.1	41.1	13.9	5.1	5.37	14.7	15.2	34.6	
1043	97.5	6.0	6.16	12.0	13.6	23.2	88.4	44.1	13.93	5.3	5.44	15.4	15.8	34.4	11.5
Fossil					✓					✓		✓			
E886	90.3	5.4	5.98	12.2	13.1	35.0	93.3	41.3	14.5	4.9	5.43	14.3	15.8	34.3	
E4035	90.3	5.3	5.87	11.7	13.0	29.6	90.2	40.7	14.4	5.1	5.64	14.5	16.0	35.1	
E4820	88.5	5.3	5.99	13.0	13.9	47.0	94.7	38.0	15.4	5.1	5.83	14.5	16.3	35.1	10.7
G2901	91.1	5.3	5.82	12.3	13.1	35.0	93.9		14.3	5.0	5.49	14.1	16.0	34.2	11.1
E3855	91.5	4.8	5.25	10.7	12.7	16.9	84.7		13.9	4.8	5.25	13.8	15.0	34.8	
J9910	87.4	5.4	6.18	11.8	12.9	35.1			14.0	4.9	5.6	14.4?	16.4	34.8	10.5
E3382	90.4	4.7	5.20	11.1	12.9	22.8			14.2	4.6	5.09	13.8	15.2	33.3	
E2041	86.9	5.2	5.98	11.8	13.1	35.8			15.2	4.9	5.64	14.1	16.2	34.8	
E4833	89.0				12.7				14.2	5.3	5.96	15.1	16.9		
E1095	89.9				13.5				15.0	5.0		14.5	16.3		
E995	87.0				13.1				15.0	5.3		15.4	17.7		
E1009	89.9?				12.7				14.1	—		14.2?	15.8		
E797	92.2				12.0				13.0	—		13.7	14.9		
E1716	86.2				—				—	5.0		14.2	16.4		
E2024	87.6				13.4				15.3	5.1		14.6	16.7		
E4139	83.3				13.2				15.8	4.8		14.2	17.0		

	length	for prep	mid rock	for dent
E4422	84.0	13.7	5.2	14.2
E4654	87.9	12.8	4.8	14.6

Tarsus	fossil	cheniway	planus	lutons
Distal end	13.0 – 15.5	14.4 – 15.8	14.9 – 16.7	14.6
prox. end	12.1 – 14.0	13.0 – 13.7	13.6 – 15.1	13.8
shaft	~~4.9~~ 4.8 – 6.0	5.2 – 5.7	5.4 – 6.5	5.7
trochl	~~4.9~~ 4.4 – 5.5	4.8 – ~~5~~ 5.3	5.4 – 6.0	5.2

conch 14.2 5.0

distal 13.7 trochl 4.7 shaft dia/pr. 4.0

3.8 3.1 3.3 3.0 5.4

20 ~~23~~ 12 35

Distal foramina

Posteriorly faced close distant

distally faced close distant

11 72 2 17 1 146

146 72 1.7 1 2 238

Measurements of tarsi
from skins

Quelpart Group Swinhoe 1878 Ibis p. 459—461 (mean 96)

lutosus – Ridgway, Bull. Hayden's Surv. 1875, p. 183
Bryant, Calif. Acad Sci. Pub. 1887, p. 283 (281–284)
3 skins measured by H at San Diego Museum

(29)

mm.

84♂	—	—	—	88♂	89♂	90♂	91.3♂	92♂
84♂				88♂	89♂	90♂	91.3♀	92♂
				88.8♀		90.1♂	91.3♂	92.7
				88.8		90.3	91.3	92.8♀
				88.8			91.3	92.8♂
							91.5♂	92.8
								92.8

— 94.3 95.1 juv.
94.3

median 91.3
mean 90.6
(skeleton = 92.2)

Cheriway measured on skins – 3 adult in A.N.S.P. coll, and
3 " ♂♀ in Bishop coll.

Brit. Catalogue
Ridgway's Manual

81.0					89	95.5						
	88.0					90.0		92	93.0			
81.7	—	83.8	—	86.0	87.3	—	89.0	90.9	91.3	92.8	93.2	94.0	95.1
				86.4			89.4	90.1			93.8.	94.4	95.4
				86.4			89.7					94.9	95.9
				86.4									

90.4 median
89.7 90.3 mean
(with two outliers)
See next page about two outliers

Skeletal measurements on 9 skeletons
give 87.8, 91.4, 93.5, 94.5, (93.6) 96.0 97.1
94.1
96.6

95.6 median
94.3 mean

Brit. Cat.
Ridgway's Manual
? typographical error 4.7 for 4.2 ; (4.2 given in earlier pub)

94.3 96.3 (119.4)
96.3

(skeletal meas. on 4 skeletons give 88.3 89.4 90.1 101.7)
mean 92.3

88.8 92.8 94.3 96.3 99.5 107
96.3

Median = 96.3
mean = 96.4

Measurements of tarsi from skins and skeletons

(30)

lutosus

84 — — — 88 89 90 91.3 92.0 — 94.3 95.1
84 88 89 90 91.3 92. 94.3
88.8 90.1 91.3 92.2
88.8 90.3 91.3 92.7
88.8 91.3 92.8
91.5 92.8
92.8
92.8

median 91.3
mean 90.7

Cherriway

(81.0-81.7 — 83.8 — 86.0 87.3 (88.0) 89.0 90.1 91.3 92.8 93.2 94.0 95.1 96.0 97.1
86.4 87.8 84.4 90.9 91.4 (92.0) 93.5 94.4 95.4 96.1
86.4 89.7 (90.5) 93.8 94.5 95.6 96.6
86.4 (89.0) (90.0) (93.0) 94.9 95.9
(94.9)

median 92.8
mean 91.5
mean 89.9

means from Sudbury figures (11)
= 91.5, 90.5, 84.4, 92.0 audubonii
P. cheijcheii 5 6 10 10

---

thanus

88.3 89.4 90.1 — 92.8 — 94.3 — 96.3 99.5 — 101.7 — — — — — 107
88.8 96.3

median 94.3
mean 94.9

thaus	a wing	tail	culmen	b tarsus	ba	length
~~♀?~~						
yg →	17.9	11.3	2.1	3.8	96.5 21.2	26 in.
ad →	15.5	9.5	2.05	3.8	24.5	22

~~15.0 10 1.2 3.5~~
~~16.7 10 1.63 3.95~~

16.0 10.1 1.2 3.7 94.3 23.1
17.7 11 1.41 4.2 107 23.7
4.17 = 119.7 27.1 ?

88.8
92.8
94.3
96.3
99.5
107.0
578.7
96.3
675.0 (96.4
7)
63
45
42
30

16.0 10 1.2 3.7 94.3 23.1
17.2 11 1.3 3.9 99.5 22.7
16.0 3.5 88.8 21.9
2 1850 ♂ ad 17.7 10 1.4 4.2 107 23.7
15.5 10 1.3 3.65 92.8 23.5

	a wing	tail	culmen	b tarsus	ba	length	
Cheriway			2.25	3.4	86.4 20.6	23	Brit Cat
♀ ad	16.5	9.5		3.4	21.5	23	
♂ ad	15.8	9.0					

14.6 8.8 1.2 3.2 81.7 21.9 20.5 Ridgway
16.5 10.0 1.48 3.75 95.1 22.7 25.0
3.4 86.4 22.3
12016 ad ♂ 16.7 9.6 3.3 83.8 21.3
ad ♀ 15.5 8.7 3.2 81.7 21.9
3.6 91.3 21.8
6 ♂ { 14.6 9 1.2 3.55 92.1 24.0
16.5 10 1.48 3.75 95.1 24.4
8 ♀ { 14.75 8.8 1.2
16.0 10.0 1.45

32-38 mm
23-26 (shell)

L.A. Mus cherriway varsi

adult ♂ 18079 93.8 ✓
♀ 17723 94.9 ✓
Brad ♂ 18688 92.8 ✓
♂ 17722 90.9 ✓
Sax 16927 95.4 ✓
Brij 18689 93.2 ✓

561.0

92.8 – median
91.9 – mean

86.0 87.3 89.0 90.9 93.2 94.0 95.4
89.4 92.8 93.8 94.4 95.9
89.7 94.9

Bishop cherriway varsi

♂ ad 48110 87.3 ✓
♀ ad 46599 94.0 ✓
♂ ad 43979 89.7 ✓
♀ yg 43189 94.4 ✓
♂ yg 43188 95.9 ✓
♂ yg 39384 86.0 ✓
♂ yg 44362 89.4 ✓
♂ yg 39385 89.0 ✓

725.7
561.0

14) 1286.7 (91.9
126
26
14
127

1286.7
86.4
86.4
81.7
95.1

18) 1636.3 (90.9
162
163

1636.3
86.4
83.8
91.3
90.1

22) 1987.9 (90.3
198
79

84 85 86 87 88 89 90 91 92 93 94 95

84
84
168

88 89 90 91.3 92
88 89 90 91.3 92
~~88.8~~ 178 90.1 91.3 92.8
88.8 270.1 91.3 92.8
88.8 90.3 91.34 92.8
442.4 360.4 456.5 92.8
91.5 555.2
547.0 92.7

94.3 95.1
94.3
188.6

26
3
2) 29 14 - 15

fossil ← 89.4 91.36 median → lithos
88.8–89.1 90.6 mean

168
176
447.4
270.1
456.5
555.2
188.6
95.1

26) 2356.9 (90.6
234
169
156

168
176
447.4
360.4
547.0
647.9
188.6
95.1

29) 2630.4 (90.7
261
204
203

2630.4
92.2

30) 2722.6 (90.7
270
226

2630.4
3

29) 2627.4 (90.6
261
174
174

		wing[a] mm.	tail	culmen	tarsus	length	bill
1692	♂ ad	402	260	32	92	609	23.9
2387	♂ ad	390	260	33	84	603	21.5
2577	♂ ad	397	260	33	88		22.1
1691	♂ ad	418	276	33	89	631	22.3
1699	♂ ad	405	268	33	89		21.9
2408	♂ ad	412	266	33	90		21.9
2504	♂ ad	418	285	33	84		20.1
2581	♂ ad	414	273	33	90		21.7
2409	♂ im	405	260	32	92		22.7
2576	♂ im	408	257	32	88		21.5

Bryant Catal. Birds Cal. p. 283 1887

lutosus

[1] See Ridgway U.S. Geol. & Geog. Surv. 1873, 461
Bull. Hayden's Survey 1876, no. 2, p. 183,
Bull. Nuttall Ornithological Club vol. II p. 5-8, Jan 1877

Ridgway Key
lutosus

♀ wing	tail	culmen	tarsus[b]	bill
15.0	10.5	1.25	3.5	23.3
16.4	11.6	1.35	3.75	22.8

Nat Museo		wing	tail	culmen	tarsus
69980	juv	15.75 —	11.25 —	1.30 —	3.7 — 94.3
69981	♀ "	15.5 —	11.25 —	1.3 —	3.5 — 88.8 mm
69982	— ad	16.0 —	10.8 —	1.3 —	3.7 — 94.3
83	— "	15.5 —	10.65 —	— —	3.6 — 91.3
84	♀ "	16.4 —	11.65 —	1.3 —	3.65 — 92.8
85	— juv.	16.1 —	11.25 —	1.25 —	3.65 — 92.8
86	— "	15.8 —	10.75 —	1.25 —	3.6 — 91.3
87	— ad	15.75 —	11.0 —	1.3 —	3.5 — 88.8
88	— juv	15.5 —	10.5 —	1.3 —	3.65 — 92.8
89	♂ "	15.0 —	10.5 —	1.25 —	3.55 — 90.1
90	♂ "	15.5 —	11.0 —	1.30 —	3.65 — 92.8
91	♂ " —	15.5 —	10.6 —	1.3 —	3.6 — 91.3
92	— ad	15.8 —	11.0 —	1.3 —	3.5 — 88.8
93	♀ "	15.5	10.6 —	1.25 —	3.6 — 91.3
94	— juv. —	15.5 —	11.0 —	1.3 —	3.75 — 95.1
95	— ad	15.75 —	11.0 —	1.25 —	3.6 — 91.3

Ridgway in Hayden's Survey

lutosus

Capsulacaulus

Distinctions between living species

	Caipernedacarpus Thanos		Lutosus		La Brea fossil	Acad pit
Size	Chemiway					
length	57.0 – 63.4 (61.1)	63.1 – 69.5 (64.9)	61.0		59.1 – 67.8 (63.2)	57.8, 59.6, 62.2
depth int pl'f ext	15.3 – 17.1 (16.2) ; 14.1 – 14.8	16.0 – 17.4 ; 15.7 – 17.2 ; 14.4 – 15.0	15.6 (17.5) ; 13.7	Lakeview 16.8	14.6 – 16.6 (17.1)	
br. troch.	5.7 – 6.1	6.4 – 7.2	6.4	6.4	5.5 – 6.5 (130)	20 Chemiway 4 = Thanos, Lut.
br. ad length	9.0 – 9.9	10.1 – 10.3	10.4			
br. rel. to depth troch.	36.0 – 39.2	38.7 – 40.8	41.0	40.0		
crest of trochlea	absent or very faintly indicated	faintly indicated (like Chemiway) to a little better developed	clearly marked	decidedly marked		
area bet. pisiform & troch.	convex ridge - like area directly connecting pisiform ant. edge & crest but where crest is slightly indicated, ridge allows faint "gully" bet. it & crest	ridge present but does not extend all the way to trochlea in many specimens slants slightly posteriorly from pisiform upward allowing good excav. ant'ly between it & crest	ridge less developed slanting more posteriorly with well marked excav. bet. it & crest ant'ly & to less extent proxly (at end of ridge)	ridge practically undeveloped except just beside pisiform area deeply excavated		
ext crest of trochlea	greatest extent at distal edge	greatest extent above distal edge (about center)	same as Thanos	medium		
area distad to pisiform	① Bounded posteriorly by faint ridge continuous with M3 not much raised above shaft ② pisiform with no (or very slight) excav. mdist	① ridge raised higher above shaft & longer in extent (bulge) M3 is farther distad) ② pisiform excavated below & slightly to rear marked so	① ridge well marked & raised ② excav. under pisiform marked	similar to Lutosus		

Distinctions between living species

	(Rt) Coracoid (left larger male spec.)			La Brea fossils	
	chemisaq	Thamnophis	lutorius	Asphalt Pit	Asphalt Pit
size length	45.8 – 53.0 49.7	49.3 – 55.9 51.2	46.9	43.6 – 50.0 47.0	45.0 – 47.8
ht prox part from facet to tip	17.3 – 19.3	19.5 – 21.6	17.5	17.5 – 19.0	
rel. ht. of 8 length	37.2 – 38.3	38.6 – 39.9	37.3	(11 spec. lower than Thamnophis 4 of these bet. chem. + Thamn.) 37.7 – 40.2 (22 specs.)	
depth head least	2.1 – 2.5	3.2 – 4.1	2.4	2.3 – 3.0	
rel. least depth of head to length	46.8 – 49.7	57.3 – 61.7	51.2	(5 specs. below Thamn.) 50.8 – 63.6 (17 specs.)	
rel. depth head to ht prox	12.1 – 13.2	14.8 – 20.4	13.7	(only 3 specs. in chemisaq) 12.4 – 16.8 (17 specimens)	
dist. to foramen from scap. facet rel. to ht prox end	8.3 – 9.4	7.9 – 9.7	8.7	6.7 – 9.1	
	45.6 – 52.2	39.5 – 45.1	49.4	(1 Thamnophis sirtalis 1 T. ordinoides) 39.3 – 48.1 20 specimens	

No physical class. not measurable are apparent

Distinc

coracoid

12

size
length

ht prox
part from
facet to
tip

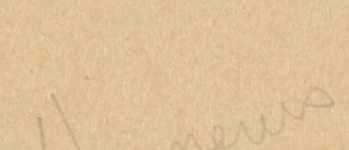
rel.
ht.
to length

depth
head
least

rel. least
depth
of head to length

rel. depth
head to
ht prox

dist of
foramen
from scap.
facet/rel.
to ht prox
end


Humerus

Distinctions between living species of Caracara

	Humeri: Cherriway	Thamnophilus	Lutosa
Size	104.2 – 115.0 116.3	119.9 – 132.5 124.3	113.3
rel. br. prox.	20.9 – 23.6	23.6 – 25.3	22.3
rel. for. dist.	15.5 – 16.7 16.0	16.1 – 17.3 16.5	17.0
bicip cent	angular antero-ext with "apex" at point of infraspinatus scar then nearly straight to below intermuscular line of bicip. surface	broadly rounded indefinite "apex" but place of great bulge of curve distal to infraspinatus scar curving thence slightly to or very slightly below the intermuscular line	similar to Thamnophilus
pneumatic foramen & fossa	foramen with sides about equal in extent & practically straight sides fossa above bicip cent grading down gradually or with slight "step" ("upper" side connecting with shaft with somewhat of an angle)	foramen more rounded side with side nearest the crest tending to be shorter than the other. fossa varying in level from above bicip cent with step & almost level with it only a faint dividing line between fossa & crest (upper & inner side) blending into the shaft	foramen with rounded sides but more pointed top than either of others side near crest shorter fossa well dished but & level of cent "dishing" runs grades up into shaft a bit (upper side? foramen sometimes shaft)
Dist. end ect epi condylar proces	rounded & not very prominent	angular & not prominent	more angular & not prominent

La Brea fossil and Pit

	100.3 – 115.3 109.3	105.8

generally intermediate but, Thamnophilus & cherriway moderately
broad, well rounded curve
with point max. extent distal to infraspinatus scar
curving to end at below the
intermuscular line or bicipital includes
some more similar to cherriway & some ident. with Thamnophilus
(but not ident.) None have greater extent of bone so far distal as lutosa

fossa above cent
in all, ~~not & sharp~~
~~fossa not bordered not~~
~~dished off as in Lutosa~~
most specimens ~~straight step~~
from fossa to cent as in ~~Type~~
in ~~Thamn~~ the region is not
gradual. Range overlaps
Thamnophilus & cherriway. one
specimen approaches lutosa as
level of fossa but is not
dished out

Distinctions between living species

Femur

	cheriway	Thaeus	lutosus
Sagl length	65.2 – 73.2 (69.8)	67.6 – 79.8 (74.5)	67.9
Gr prox	15.5 – 17.0	17.3 – 19.9	17.1
depth prox	10.6 – 12.3	12.6 – 13.5	12.5
ree Gr prox to length	22.9 – 24.8	24.9 – 26.7	25.1
ree depth prox end	16.2 – 17.1	(length from) 16.9 – 18.8	18.3
curvature	curving inward T backward seeming to follow direction of apex of post. ridge shaft seems also to follow. The curve inward	straighter – internal side may curve as much but outer flares outward (not inward) thus broadening Dr end	between Thaeus & cheriway – in curve. Outer edge flared thus receding inward to Gr
Obturator ridge	faintly to mildly marked & generally rounded with almost almost no excav. internal to it	ridge not much more marked than cheriway but generally more sharp – excav. also like cheriway	ridge prominent T sharp excav. marked internal to it.
general effect	slender bone curving inward at prox end nearly equally on both outer & inner sides	stocky bone flaring outward on outer side, inward on inner side at prox. end	stocky bone curving outward on internal side almost straight The slightly flaring (inverting) on outer.

La Brea fossil	Acad Pit
61.7 – 72.8	62.8 – 66.0
14.6 – 18.1	
10.6 – 12.7	6 spec.
23.2 – 26.2	
16.8 – 18.6	

Some curved like cheriway
others straighter & flared

most are more prom. than cheriway (not all)
mostly excavated (not all)
sharpness varies

Dist

Femur

Size; (length

br prox

depth prox

rel br prox to length

rel depth prox end

curvature

obturator ridge

general aspect

Tarsonetatarsus

Distinctions between living Caracaras

(2)

(3)

Tarsus

	Cheriway (22 skins)	Thanus (7 skins)	Lutosus (29 skins)	La Brea fossil	Acad. Pit
Size skins	81.7 — 95.9 (96.4)	88.8 — 107 (90.3)	84 — 95.1 (90 ±)	81.9 — 94.8 (88.3)	85.1 — 89.0 (87.0)
skel.	9 skels. 87.8 — 97.1 (94.3)	4 skels. 88.3 — 101.7 (92.3)	1 skel. 92.2		
tib. br prox	13.7 — 14.9 (shortest spec.) (14.1)	14.8 — 15.3 (longest spec.)	14.9 15.9		
tib. br dist	15.1 — 16.7 (shortest spec.) (15.6)	16.4 — 17.0 (longest spec.)	15.8 17.8		
reb br shaft middle	5.6 — 6.2 (shortest spec.) (5.8)	5.6 — 7.4 (longest spec.) (6.5)	6.1		
br med. tarsus to depth	52.5 - 56.3	59.0 - 64.7	56.4		
int. side of shaft	faintly depressed along post. edge not up to ant. edge proximally post. edge more rounded than angular with deepest pt 10-15 mm below tip of calcaneum	depression more deeply marked & less confined to post. edge (set them more centrally located on tendency to run up proximally toward the ant. edge; post. edge angular (more acute) 5-8 mm below tip of calcaneum	similar to Thanus but depression markedly & ant. ly	extends nearly proximally	depth & extent of depression similar to lutosus contour generally angular but sank tending to round Point of greatest depth 7-11 mm from tip of calcaneum
br prox	13.0 — 13.7	13.6 — 15.1	13.8 14.6		
br dist	14.4 — 15.5	15.7 — 16.7	15.7		
br sh.	5.2 — 5.7	5.4 — 6.5	5.7		
br. trochl.	4.8 — 5.4	5.4 — 6.0	5.2		

Distinctions between living species

Beak

	cheriway	Thamnophilus	Clitoniss	La Brea fossil
length from base of culmen to top of nares	26.3 – 29.5	24.8 – 27.1	24.5	21.6 – 23.9
Br. below nares.	12.5 – 13.4	13.9 – 15.1	15.1	13.0 – 14.8
rel br to length	45.0 – 49.5	55.7 – 57.9	61.6	58.1 – 67.6
nares to culmen	10.5 – 11.3	10.2 – 10.6	9.3	7.6 – 8.8
Height	16.5 – 17.3	15.6 – 17.8	16.0	14.4 – 15.0
rel. ht to length	59.7 – 64.9	62.3 – 67.0	65.3	62.8 – 67.3
nares to Br	81.9 – 89.7	59.6 – 65.5	64.4	54.7 – 59.0?
Br to culmen	73.0 – 79.1	84.9 – 93.0	94.4	90.3 – 101.4
Lines above (attitude) below nares	lines look approx. even with cant. Border of nares (one more so than the) lower one) nearly straight down to narrow upper line well ant. to septum	lines set back farther & lower one slanting well posteriorly & narrow upper line about at center of nares, slightly on line with cant. to septum	lines set back with upper one posterior to center of naris & open post. to septum	lines back like Thamnophilus upper one varying from slightly cant., even with, & post. to septum
Shape of nares (contour)	tend to be long narrow, slitlike, upper & lower part approx. equal (long, narrow, even)	tend to be broader for length, & shorter lower part broader than upper. The effect is slitlike usually a major less on notched crook between the two sections (broad, short, uneven)	same as Thamnophilus perhaps even broader	in general short & broad have crook but not all are broader at lower part, this the tendency is such

Beak

11 T 11a

Dist

length
front
culmen
d) nostril
to topog ra

Br.
below
nares.

rel br.
to length

nares
to
narres

Height

rel. ht
to length

nares
to br

br at
ht

Dives
bord (at bridge
below
nares

Shape
of nares
(constant?)

Distinctions between living species

	Tibia				La Brea fossils
	Cheriway	Thamnotherium	Antrostomus		
vert. length to ant. surf.	107.7 – 118.8 114.5	107.8 – 122.1 112.6	108.6		100.5 – 112.3 106.2
br. prox	12.3 — 12.9	13.2 – 13.5	13.5		11.7 – 13.0
br. dist	13.0 – 13.8	13.5 – 14.9	13.1		12.2 – 13.3
rel br. prox	10.8 – 11.8	11.8 – 12.8	12.5		(5 + ½ cher. + Thamn. 6 spec.) 11.0 – 12.0
rel br. dist.	11.2 – 12.1	12.2 – 12.7	12.6		(4 cheriway + A. s. spec.) 11.4 – 12.6
area beneath projection ant. surf. partly	excavated above and/or ant. to tubercle with ridge extending to border just to the tubercle top parallel Dorsto Internal	area not excavated in some specimens only a ridge indicated to tubercle ant. parallel and absent or just faint mark indicated	Same as Thamno		15 area unexcavated + no ridge 18 faint ridge, no excav. 6 faint excav. + ridge

Tibca

14?

Distrie

mid length

to ant. surf.

br prox

br dist

rel br. prox

rel br. dist.

area beneath articular surf. partly

Distinction between Lindsposits

Ulna

	Cherriway	Manis	Lutrinae
Sizg:	109.0 — 122.5 (117.9 sp?)	129.1 - 132.4 (124.3)	113.1
br prox diagonally	13.9 — 14.9	15.6 — 16.7	15.5
br dist	9.7 — 10.5	10.6 — 11.9	10.0
rel. br. prox diag'l	11.9 — 12.9	12.8 — 13.7	13.6
rel. br. dist	82.4 - 89.0	86.3 — 93.7	88.5
br sh.	4.8 — 5.2	5.7 — 6.3	5.7

slender ends prox. and shallower

heavier ends prox. and deeper

No physical chars. diag.

	La Brea fossil	Acad Pit
	109.9 ~ ~~111.1~~ - 122.3 (116.2)	109.9 - 112.1
	14.1 - 16.3	
	9.2 - 10.4	
	10 [10 spec. Lit cherriway] 12.3 - 13.4.	
	79.6 - 88.6	
	5.3 - 6.1	

Dist

Siz

br prox diagonall

br dist

rel. br. prox diag'l

rel. br dist

br sh.

N

Ulna
13